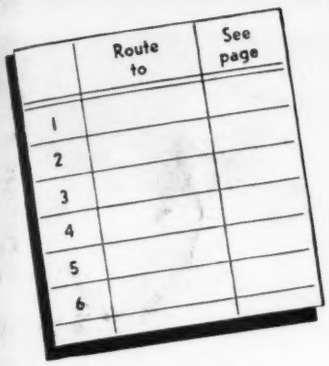


Contractors and Engineers Monthly

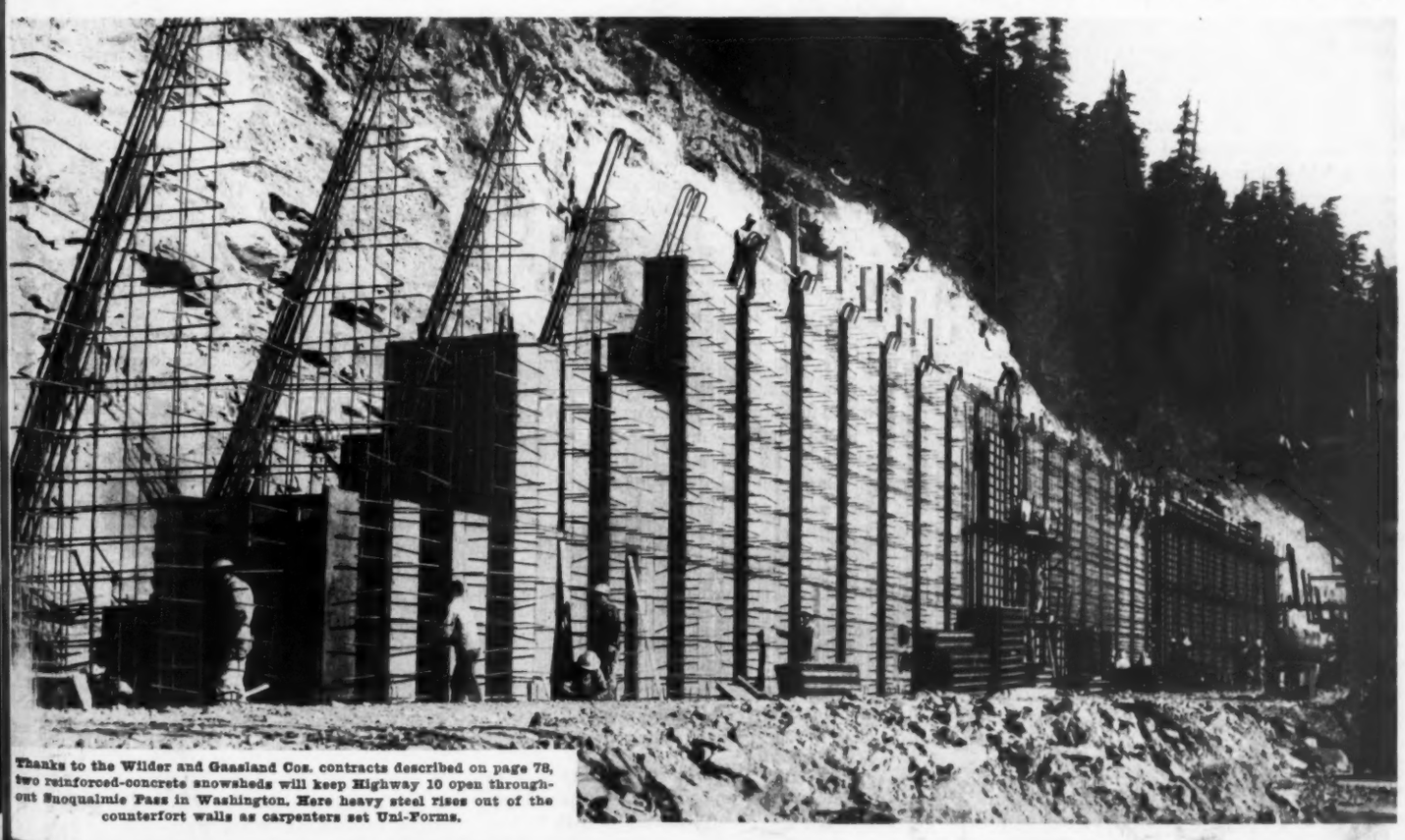
Vol. 48, No. 2 FEBRUARY, 1951

Covering the Field

- **Mobilizing for Job Ahead**
  Come warm war or all-out war, there's much you can plan and do now. For Admiral Cotter's suggestions on mobilization see page 3.
- **Harbor Slopes Paved**
  Asphalt protects hydraulic fill from Mississippi wave wash at Memphis Harbor. Page 5 tells how it was laid.
- **Bridge on Mud**
  Columns supporting the towers extend as much as 330 feet below the deck through mud to rock. Job report on page 11.
- **Glass Apartment House**
  Well, not exactly. But unique steel framing permits floor-to-ceiling windows on all stories. Take a look at page 24.
- **Wilderness Grading**
  And rock-base work too, for 18 miles through Montana mountains. A big assignment in anybody's language. Page 30.
- **Bituminous Road Work**
  Local gravel was the cost-cutter on some Maine hot-mix. See page 35.
  Asphalt stabilized a base of native Kansas material. See page 61.
- **Building Industries Meeting**
  Delegates and speakers took a grim look at the impending wartime curbs on building construction. Page 40.
- **Dam Tunnels Sawed, Lined**
  A shop-built jumbo and concrete-temperature control highlight the double header, with pictures, on page 44.
- **Paving at Airport**
  A new concrete runway goes in at Detroit Wayne Major Airport. Details on page 54.
- **Care of Equipment**
  There's nothing hit or miss about the upkeep described on page 65. It's programmed—standardized where possible.
- **Bookkeeping**
  Simple forms illustrated on page 70 take the chore out of bookkeeping for contractors big or small.
- **Concrete Paving**
  It was a patchwork job scattered over 16 miles, but it rehabilitated an old road and stretched dollars. See page 74.
- **Snowsheds Built**
  The two reinforced-concrete structures are Washington State's answer to danger-our slide zones. Page 78 covers the job.
- **Concrete Patching**
  How a state jumped its patch output—try the picture story on page 88.
- **Sewer Construction**
  Trenching was anything but routine through rock, hardpan, clay, and quicksand. Water troublesome too. Page 96.

(You will find "In This Issue" on page 4)

C. & E. M. Photo
To protect nearby houses during sewer-trench blasts, a Lima Faymaster backhoe places a woven-wire mat over area to be shot. Page 96 covers Guild Construction Co.'s sewer job.



Thanks to the Wilder and Gaasland Cos. contracts described on page 78, two reinforced-concrete snowsheds will keep Highway 10 open throughout Snoqualmie Pass in Washington. Here heavy steel rises out of the counterfort walls as carpenters set Uni-Forms.

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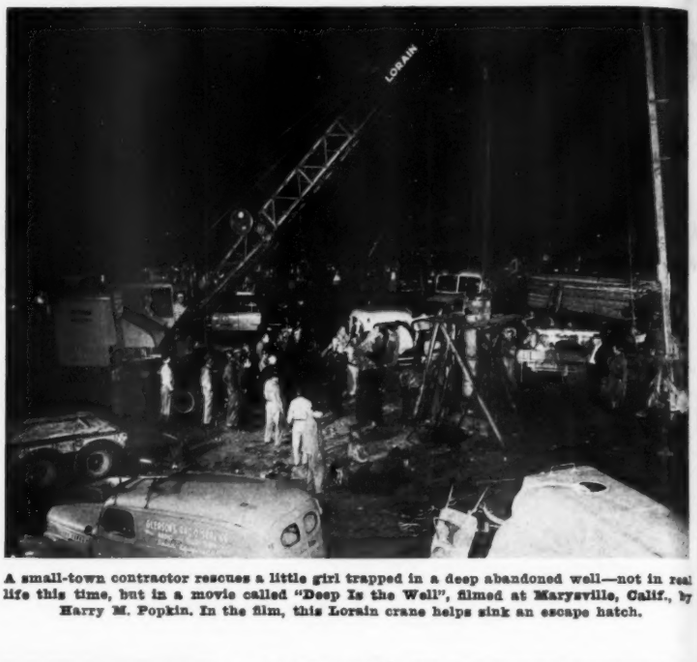

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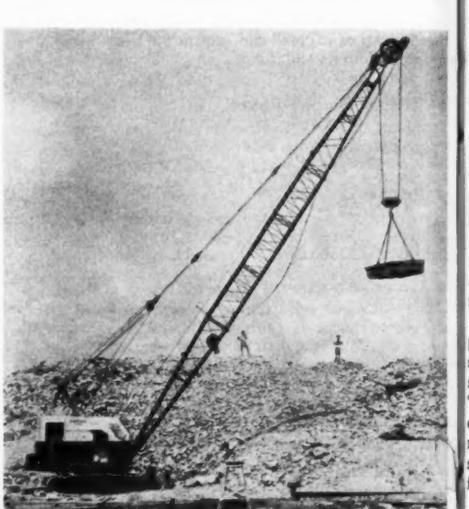

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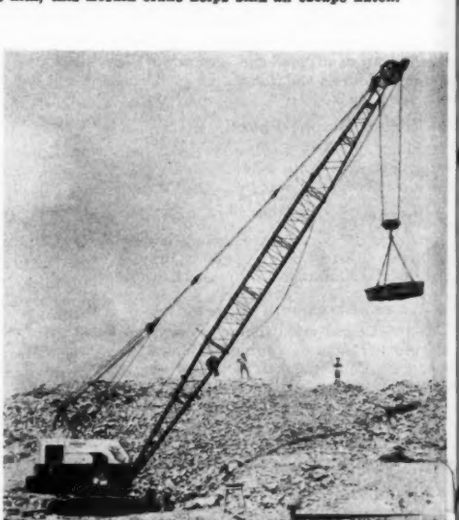

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Mobility

There are five M's of good business practice followed by every successful contractor, said Admiral Cotter; in the present situation, they take on special urgency. The first of these is Mobility —preparedness to enter new fields of construction.

"The pattern of American construction is headed for increasing change as priority needs inevitably dictate sharpened distinctions between 'essen-

(Continued on page 85)

*On January 31, Admiral Cotter resigned as president and a director of Merritt-Chapman & Scott, to devote his time to activities connected with the national preparedness program. He will continue his association with the firm as consultant.

Contractors and Engineers Monthly

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For the Highway and Heavy-Construction Industry

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The Story No One Writes

It's shocking to study written matter passing over anybody's desk in this business, and see the scarcity of private engineering. Federal, state, city, and county work tops the stack. Compare the percentage of its publicity, and you'd think there wasn't such a thing as private enterprise.

It's the forgotten story; the tale no one writes.

And yet, private engineering and capital built the biggest part of this country. New York City's skyline was a reality long before the era of government money lenders and publicity men. A study of any reputable construction report will show that private enterprise is still doing its job, however quietly.

The Army Corps of Engineers has done some fine work, but 30 years before it thought of Fort Peck Dam, private enterprise whipped a wilderness and threw seven hydroelectric barriers across the unruly Missouri River. They were the first dams on the stream. The Bureau of Reclamation has done a lot of fine irrigation engineering. But when its entire record of accomplishment was compared at Spokane recently with what private enterprise had reclaimed and irrigated *in Texas alone*, the USBR came up over a million acres short!

Similar comparisons with private engineering of many another government agency would show beyond a doubt what an excellent job the private engineer is doing.

But let's dig deeper. Experience tells us that private engineering is likely to be the best engineering, because construction financed by owner capital reaches the optimum of cost consciousness. Economic values mean something when private enterprise builds. Owners can't usually afford to waste money.

The economic laws which rule private engineering are brutally simple. When a private investor has to pay taxes actually to help underwrite competitive tax-free government work, he's got to demand better designs, daring plans, and real cost values. He's got to stimulate contractor competition all he can, to get the best job for the least money. He's got to have a resident engineer who can handle authority, because his resident engineer has to deal directly with the contractor in most cases to reduce red tape and increase speed.

Why, then, is the story of private enterprise not being told as well as it might be?

There are many reasons, and a few excuses.

Publicity costs money. Private engineers are not, generally, as publicity-conscious as their government counterparts. Private owners almost always take a dim view of publicity. Handled wrong, it can hurt the company. It can reveal trade secrets to the competition. At the very best, even if handled right, it cannot improve whatever product the company makes. Those are some of the reasons.

Private engineering projects are harder than government jobs for a newsman to cover. It takes more time. It takes patience and tact. It takes background experience and hard work because there isn't a ream of background matter handy on a private job. So why should a reporter waste a week getting permission and facts from the owner, the architect, and the usually close-mouthed superintendent, when he can cover a state or government job in a day? Those are a few of the excuses.

It seems to us that they are insidious excuses. For unless this forgotten story is told with increasing vigor by private enterprise and independent newsmen, a tale will be less than half told.

The solution? The private story must be told. Private engineering and owner interests should rid themselves of real and fancied prejudices, and begin to realize the value of intelligent publicity. The press must try harder than ever to get the story, and tell it without slanting.

CONTRACTORS AND ENGINEERS MONTHLY has always opened its pages to this subject, but in the days ahead it will spend even more time, effort, and money along this line. Federal war projects, highway construction, and other public works must certainly continue to rate a fair share of space, but the story of private U. S. construction work should be better publicized.

"You know there are other things I could be doing!"

Oldest Motor Grader in U. S.?

To the Editors,
CONTRACTORS AND ENGINEERS MONTHLY:

I enjoy reading your . . . magazine. It has a lot of good reading and information for engineers and road builders . . . I have been engaged [in road building] most all my life. I read with a great deal of interest the article on page 4 of the November issue, Vol. 47, No. 11, entitled "Hail to the Motor Grader."

I have been in public life for 40 years serving as Mayor and Councilman for the city of Palo Alto, and I retired from the Board of Supervisors of Santa Clara County after 28 years of service. Our county, the same as all others, is divided into . . . districts. The fifth was the one I represented. As my job was to build or rebuild and repair some 350 miles of roads . . . my first task was to secure suitable equipment to do this work. There was nothing to be had other than horse-drawn graders, which were too slow, so I decided to build a grader propelled by its own power.

I bought a large truck with a long chassis and suspended a 10-foot grader blade under the frame with controls leading back to a platform at the rear of the frame, to be operated by a man at the rear. The truck was driven by the driver in the cab. This piece of equipment did most wonderful work as a grader. Later I mounted a 1,000-gallon steel tank on the truck with sprinklers at the rear, to be used in road construction or repair.

This was in the year 1921. I have a moving picture of this piece of equipment working. I believe it to be the first motor grader built or used in the United States. . . .

With kindest personal regards,
C. P. Cooley
Palo Alto, California.

Help insure America's security and your own. Buy U. S. Savings Bonds.

In This Issue

Production Authority Names Industry Advisory Committee

The National Production Authority has named the following men, each representing one of 16 major segments of the construction equipment industry, to the Construction Machinery Industry Advisory Committee:

W. B. Greene (Barber-Greene), Kenneth Lindsay (Iowa Mfg.), J. R. Steelman (Koehring), F. Salditt (Harnischfeger), P. H. Birckhead (Bucyrus-Erie), G. A. Gilbertson (Hough), Ralph K. Stiles (Austin-Western), Ray McLean (Jaeger), M. D. Shaffer (Buffalo-Springfield), R. E. McCluskey (LeTourneau), Gail E. Spain (Caterpillar), E. B. Hill (Gar Wood), E. F. Armington (Euclid), O. J. Neslage (Joy), S. R. Ives (Armco), Ray Arnold (Arnold Machinery).

Urges Engineer Reserve

America's seed corn is her scientific and engineering manpower. Last September Robert L. Clark, Director of the Manpower Office of the National Security Resources Board, asked the Engineers Joint Council to prepare a program for the most effective use of that seed corn in the national effort. In answer, the Council's Engineering Manpower Commission has proposed a reserve of engineers.

The EMC asks that the reserve be created by registering, through selective service, every man to the age of 70 who has a bachelor's degree with a major in one of the critical fields of engineering, or who is enrolled in a program of training leading to a bachelor's or higher degree in one of those fields, or who is employed in one of those fields. It asks that a National Engineering Personnel Board be set up to review registrants, classify them, and make selections for military, civil defense, and industrial allocation. The Board would advise the President as to needs and allocations, and administer the reserve. Regional boards would be appointed as directed.

That both military and industrial requirements for engineering personnel would be considered in its plans, was emphasized by the EMC.

The EMC points out that by 1954 there will be a cumulative shortage of over 40,000 engineering graduates. Yet a "fundamental and essential condition of any program of defense depends on realization that the survival of the United States as a free democracy in the world-wide struggle for control will depend on superior and prior scientific and engineering skills to offset superiority of numbers which the free nations lack." Faced with that need and that shortage, we cannot afford to expend what seed corn we have promiscuously and haphazardly, the Commission warns.

Harbor Fill Slopes Paved With Asphalt

Floating Plant Produces Mix Laid by Finisher in 5-Inch Course On River Side of Memphis Project

• IN the construction of the new harbor at Memphis, Tenn., the north or river side of the new hydraulic fill is paved with asphalt as protection against the wave wash of the Mississippi current. This paving will extend along the upper portion of the industrial-site fill, and across the closure embankment that shuts off Tennessee Chute from the main channel of the river. These filled areas forming the harbor were built up with sand dredged from the bottom of the new harbor, or from cuts taken along the river bank. (See C. & E. M., November, 1950, page 60.)

Memphis Harbor is a project of the Corps of Engineers, U. S. Army, Memphis District, in cooperation with the Memphis and Shelby County Port and Harbor Commission. Started in 1948, the extensive waterfront improvement is scheduled for completion in 1953 at an estimated Federal cost of $21,600,000. Right-of-way and operating facilities for the inland harbor are handled by the City of Memphis and Shelby County.

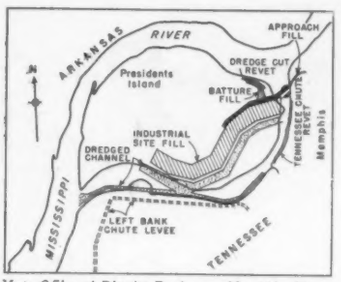
The harbor is formed by closing off the upper end of Tennessee Chute, a channel along the left bank of the river between the mainland and Presidents Island. Material dredged from the channel and pumped out along one edge of the island provides a stable fill for the industrial site of the port. The initial asphalt paving on the project is on the riverside slopes and berm at the upper end of this fill. The Corps of Engineers awarded a contract to the Forcum-James Construction Co. of Dyersburg, Tenn., on a low bid of $224,490 to lay 21,000 squares of pavement. A square has an area of 100 square feet. Necessary fine-grading was included in the contract. Paving started the latter part of April and was expected to be finished in September. A future contract will include paving the up and down stream slopes of the closure embankment.

Uses River Sand

The bituminous paving consists of a single 5-inch, uncompacted course of sand-asphalt mix, produced in a floating plant with the proportions 94 per cent sand and 6 per cent asphalt. Sand, dug from the river and screened to remove sticks or coarse material above ¼ inch, served as the aggregate. The hot-mix paving, laid with a mechanical finisher, extends along the fill for about 7,000 feet. It includes a berm or apron 200 feet wide at the base of an 8 to 1 slope which is also paved along a 200-foot width.

River sand for the aggregate was stockpiled along the channel side of the industrial-site fill where the floating asphalt plant was tied up. The complete plant requires two barges for its operations. The barge moored directly alongside the channel had a steel hull measuring 160 x 35 x 8 feet, and carried a crawler crane equipped with a 70-foot boom and an Erie 1½-yard clamshell bucket. This rig dug the sand and helped build up the shore piles with a Caterpillar D7 tractor-dozer. The crane also boomed around to load the aggregate into the hoppers on the mixing plant, which was set up on another steel barge tied alongside the crane barge.

The barge holding the asphalt plant had a large hull, 220 x 38 x 9½ feet, that held 207,000 gallons of bitumen in its 18 below-deck storage tanks, each with a capacity of 11,500 gallons. AC-8, with an 85 to 100 penetration, was used in the mix. The big barge also held 125,000 gallons of bunker C fuel oil in 11 other storage tanks. The bunker C oil fired the burners for the boilers and dryers. In addition, the craft stored 10,000 gallons of diesel fuel used in the diesel-electric generators. Fuel and oil were supplied by Standard Oil Co. of Louisiana, delivery being made to the job site in the contractor's own fuel barge.



Map, Office of District Engineers, Memphis, Tenn.

The new harbor at Memphis, Tenn., is formed by closing off the upper end of Tennessee Chute, a channel along the left bank of the Mississippi between the mainland and Presidents Island. Material dredged from the channel provides a stable fill for the industrial site of port.

Floating Asphalt Plant

Sand was taken from the stockpiles by the crane to fill the twin hoppers on the floating asphalt plant. The first

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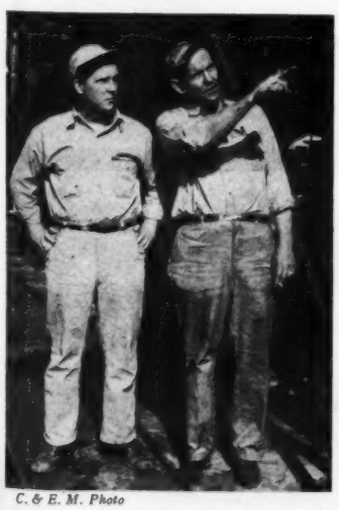

C. & E. M. Photo

Superintendent W. C. Stricklin (left) and E. C. Moss alongside the plant's Simplicity dryer.

C. & E. M. Photo

This is the floating plant which produced hot-mix to pave the harbor fill slopes. The crane barge is at the left. The diesel-engine power plant is inside the wooden deck house.

Harbor Fill Slopes Paved With Asphalt

(*Continued from preceding page*)

half of this plant including hoppers, feeders, and two dryers is a Simplicity System, while the latter half where the mixing is done is a Barber-Greene. A separate feeder at the bottom of each hopper directed the sand into the twin dryers, 54 inches in diameter x 20 feet long. The hoppers were high enough off the deck so that cold elevators were unnecessary in handling the aggregate. Each dryer was heated by a pair of Hauck burners at the discharge end, raising the temperature of the sand to between 325 and 375 degrees F. Each dryer was also equipped with its own dust collector that functioned from a 48-inch fan.

Belts carried the heated sand to the foot of a hot elevator, 35 feet high, made up of a single line of 16-inch buckets. At the top of this enclosed lift the aggregate emptied into a hopper at the bottom of which was a chain feeder that moved the sand along to a Barber-Greene heavy-duty 848 continuous-type mixer. After the 94 to 6 sand-asphalt ingredients were mixed in the pugmill, the blacktop dropped onto a 24-inch conveyor belt, 25 feet long, that overhung the adjoining barge holding the crane rig. Trucks backed out on this barge over a bridge from the shore, two at a time for loading, as the conveyor was shifted from side to side filling first one truck and then the other.

Steam for the plant operations—heating stored asphalt, jacketed lines, etc.—was furnished by two locomotive-type oil-burning boilers that housed under a sheet-metal roof at one end of the plant barge. Both boilers—a Kewanee and an Oil Well Supply Co. unit—were rated at 125 hp.

Inside a deck house at the other end of the barge was the power plant. The prime mover was a Buda 6 DCS 1879 diesel engine driving a Clark 125-kw electric generator. Power from this set ran the various motors that operated the plant. They included a Clark 50-hp and a G-E 25-hp motor on the two dryers; two G-E 1-hp motors actuating the belts carrying the heated sand from the dryers to the hot elevator; a G-E 75-hp unit on the fan; a Clark 50-hp motor driving the hot aggregate feeder and mixer; a G-E 7½-hp motor on the hot elevator; a G-E 10-hp motor on the loading conveyor; and a 2-hp motor working the 2-inch fuel pump. The power plant also included a Caterpillar 6600 diesel driving a 30-kw electric generator that supplied current for lights, welding machines, tools, etc.

Water for the boilers and other functions of the floating plant was pumped from the river into tanks on the barge.

Hauling and Laying the Mix

The sand-asphalt mix was hauled from the floating plant moored in the channel, across the fine sand of the hydraulic fill, to the riverside slope of the industrial area. No ordinary trucks could move over this sandy expanse that resembled a rolling desert waste. So the contractor secured a fleet of 8 former Army half-tracks equipped with White 160-hp engines, and fitted them out with either Heil or St. Paul hoists and dump bodies holding from 3 to 4 cubic yards. The sides were later planked up to increase their capacity to from 5 to 6 yards. The regular front tires were removed and replaced with fat 17.00 x 16 airplane tires from surplus B-17 or B-24 bombers. With the wide-tread low-pressure tires in front, and rubber-tread crawlers at the rear, these vehicles negotiated the heavy sand with full loads. One-way

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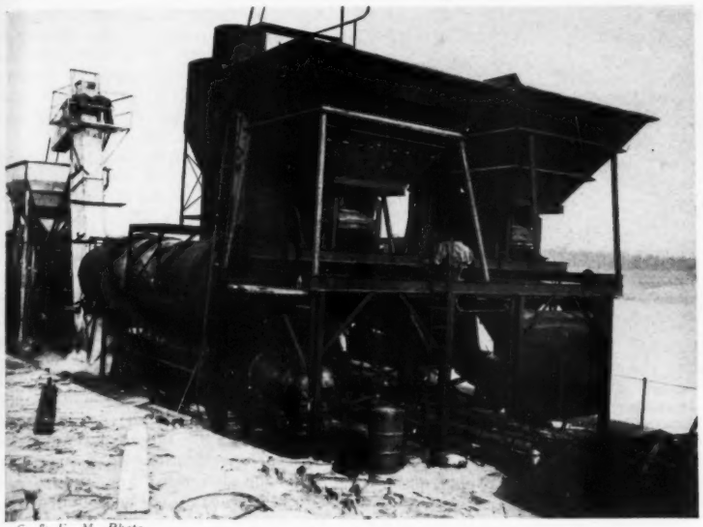


C. & E. M. Photo

A closeup of the Simplicity portion of the floating asphalt plant.

C. & E. M. Photo

To give this Barber-Greene Finisher greater bearing and traction in the soft fine sand, its tracks were widened from 10 to 20 inches. Forcum-James' Superintendent W. C. Stricklin has his hand on the widened treads.

hauls averaged a mile.

The 5-inch uncompacted course of plant mix was laid by a Barber-Greene Finisher which was altered to meet these unusual job conditions. The track on each side was widened from 10 to 20 inches to give the machine greater bearing and traction in the soft, fine sand. The screed and tamping bar were removed, along with the 1,500-pound counterweight adjoining the hopper at the rear of the machine, thus lightening the finisher considerably.

Then a special strike-off was installed at the front end with adjustable eye bolts to give the desired 5-inch depth of mat; new shoe plates were also installed at the sides. The steel strike-off was set close to the screw feeding the material from the hopper, thus insuring always enough hot-mix at the front end of the machine. With this setup the finisher laid the required depth of mat without loss of forward speed.

The floating plant turned out a maximum of 1,200 tons of hot-mix in a 10-hour day, with the finisher laying 450 squares, or 45,000 square feet, in the same length of time. Lanes are 12 feet in width on the average; the 200-foot-wide apron was laid in 16 passes along the length of the berm, usually in 2,000-foot strips. On the slopes the 12-foot lanes were laid at right angles to the river bank. No forms were required. Approximately 50,000 tons of plant-mix were needed to lay the 21,000 squares of pavement.

Personnel

Forcum-James Construction Co. employed an average force of 25 on the project under the direction of Superintendents W. C. Stricklin and E. C. Moss. G. J. Sander is Manager of the Asphalt Division of the company.

For the Corps of Engineers, Earl Houston is Project Engineer on the Memphis Harbor Project, assisted by J. K. Patterson. Col. L. H. Foote is District Engineer at Memphis, and Lt. Col. R. C. Bahr is Assistant District Engineer.

Remember: safety is no accident.

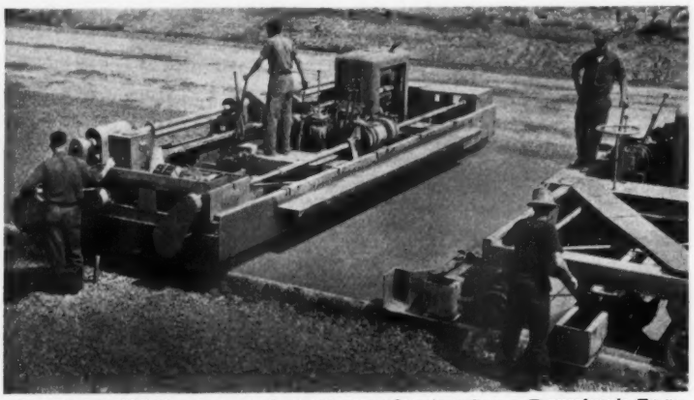
Concrete Spreader Has Metering Screed

A new concrete spreader with an oscillating metering screed has been developed by The Jaeger Machine Co., Columbus 16, Ohio. Available in two models (10 to 15 and 20 to 25-foot width) it combines a transverse 12-inch oscillating screed with the Jaeger remixing-compacting screw spreader. It is claimed to be the only spreader offering the triple function of spreading, initial strikeoff, and precision metering of concrete for the following finisher.

Jaeger points out that the action of the screw spreader eliminates honeycombing and segregation, and makes it possible to spread stiff mixtures uniformly from form to form. The strikeoff plate, immediately behind the screw, makes the initial strikeoff to approximate grade line, then the 12-inch oscillating screed makes precision strikeoff and meters the material to the finisher. This is said to eliminate carryback by shovelers and delays in backtracking the paver. Any unusual deficiencies of material can be seen and corrected. With no deficiencies or excesses of material, the finisher can work farther back from the spreader, permitting concrete to condition properly.

This new screw-screed spreader and Jaeger's Type X diagonal-screed finisher are designed to form a "three-screed paving team" capable of handling full output of the largest pavers. The team—with spreading, initial strikeoff, and precision metering accomplished by the first unit, and transverse and diagonal screed finishing by the second—is said to eliminate the need for a second finisher on high-speed paving. Jaeger also points out that the screw-screed spreader can spread and strike off base course on its first pass (with screed raised and inoperative), back up for the pavers to pour the top course, then make its spreading, strikeoff, and precision screeding pass (with screed lowered and oscillating). On paving which calls for bituminous or brick surfaces on concrete bases, it is said that the screw-screed spreader will remix, compact, and spread that base uniformly, strike off to approximate grade line, and adequately finish it, with no additional mechanical finishing necessary.

Both models offer 5-foot adjustability in 6-inch stages. The spreading screw on the 10 to 15-foot model is reversible for spreading material toward either side form. On the 20 to 25-foot model, the screw is divided and permits spreading from center to side forms, side forms to center, or toward either side with both halves of the screw operating in the same direction. Directional control of the screws is instantaneous. On both models, the oscillating metering screed is Jaeger's single-lever quick-crown-change type, hydraulically lifted and with spring-cushioned action.



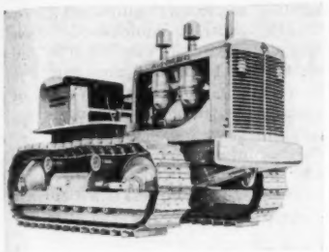
Jaeger's new CSS-20 screw-screed concrete spreader at work on a Pennsylvania Turnpike extension. The rig offers triple action—spreading initial strikeoff, and precision metering of concrete for the following finisher.

Further information may be secured from the company by requesting Catalog CSS-0. Or use the Request Card at page 16. Circle No. 521.

Air and Hydraulic Valves

A 4-page folder on valves for air or hydraulic use has been issued by Pneu-Trol Devices, Inc., 1436 N. Keating Ave., Chicago 18, Ill. These compact valves are available in five types for pipe sizes of ⅛, ¼, ⅜, ½, and ¾ inch. The catalog points out that all Pneu-Trol valve pipe threads are made to Dryseal specifications to assure tight joints and eliminate air or fluid leakage.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 511.



Two new crawlers have augmented the Allis-Chalmers tractor line—the HD-9 with 70 drawbar hp and the HD-15 with 102 drawbar hp, shown here.

Two New Tractors

Two new crawler tractors have been added to the line of Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee, Wis. With the HD-9 and HD-15, the company offers a tractor in each of four major power classes. The HD-9 weighs 18,500 pounds and has a drawbar horsepower rating of 70. The larger HD-15 weighs 27,500 pounds and develops 102 hp at the drawbar. Both have six speeds forward and three reverse.

The tractors feature a constant-mesh transmission with separate reverse gears which allow an operator to shift from forward to reverse in any speed with one movement of a single control lever.

Power is provided for both models by heavy-duty General Motors 2-cycle diesels. These engines utilize a unit injection system designed to eliminate high-pressure fuel lines and permit instant electric starting on diesel fuel. Unit assembly construction makes it possible to remove and install each unit in the power train—engine, clutch, transmission, steering clutch, and final drive—without disturbing related assemblies. The new crawlers have positive seals in final drive, truck wheels, idlers, and support rollers. These spring-loaded seals retain grease for 1,000 hours, the company reports. Other features include an adjustable seat, boosted steering, convenient grouping of controls, self-energizing brakes, and a tapered cowl for better visibility. A complete line of matched allied equipment including bulldozers, scrapers, and front-end shovels will be available for both new tractors.

Catalogs describing each of the new tractors may be obtained from the company. Or use the Request Card at page 16. Circle No. 509 for information on the HD-9; circle No. 515 for the HD-15.

Road-Striping Machines

A bulletin about a full line of highway center-lining and safety-lane-marking equipment has been offered by Kelly-Creswell Co., Xenia, Ohio. Machines described range from the small Model C industrial stripers, through the Model B-3-P all-purpose striper, up to the big triple-line highway markers. The folder contains complete descriptions, specifications, etc.

The literature points out that with Kelly-Creswell equipment, straight-edged lines may be applied to any type of surface, at any speed, by directing compressed air or exhaust gas against the edges of the spray pattern through specially designed millings in the air curtains. The striping guns are said to produce a fan-shaped pattern with uniform cross-distribution and positive control of film thickness. These guns come in three sizes depending upon the speed of application required and the viscosity of the marking material. Manual air-controlled types are available. The width of the line is variable between 2 and 6 inches.

The specially designed pressure cleaner mechanism, which forces atomized cleaner fluid through the fluid lines and the spray guns, reduces the time necessary to clean the machine at the end of a day's run. The company also points out that a full line of hand-spraying equipment is available for any of the models, for painting guard-rails, bridges, buildings, etc. A full line of replacement parts is maintained.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 484.

Steel H-Beam Bearing Piles

A 100-page fully illustrated booklet on steel H-beam bearing piles has been issued by Carnegie-Illinois Steel Corp., 434 Fifth Ave., Pittsburgh 30, Pa. It offers general and technical data on the use, performance, design, economies, and installation of the piles, and includes specifications. All of the material is treated in detail and clearly. A large number of on-the-job photos show field applications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 464.

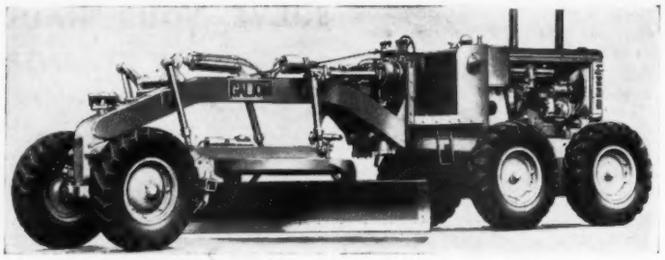
A New Waterproofing

A new transparent waterproofing material, Dashide, has been developed by The Dasco Co., Inc., 1602 Thames St., Baltimore 31, Md. Designed to eliminate water penetration through brick, concrete, cement, or cinder blocks, the product is said to penetrate deep into the porous wall and quickly seal all cracks. Dashide may be sprayed or brushed on, and one gallon is said to cover approximately 100 square feet with a double coat. The manufacturer states that this product is resistant to acid and alkalies and will not run, crack, check, crystallize, or peel under any temperature or weather conditions.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 532.

Harnischfeger Manager Dies

A. H. Flowers, Diesel Division Sales Manager for Harnischfeger Corp., died last December.



Galion's new Model 118 heavy-duty motor grader has six overlapping forward speeds from 1.3 to 22.6 mph, and 2 reverse speeds. High reverse speed is 10.5 mph.

A New Motor Grader

A new Model No. 118 heavy-duty motor grader announced by The Galion Iron Works & Mfg. Co., Galion, Ohio, features an improved transmission of the constant-mesh type. It has six overlapping forward speeds ranging from 1.3 to 22.6 mph and two reverse speeds. High reverse speed is 10.5 mph; this feature is desirable when restricted working conditions do not permit turning the grader around, Galion says. One lever is used for shifting all gears, forward or reverse.

Other features of the Galion No. 118 are a 100-hp diesel engine; positive all-gear four-wheel tandem drive; full hydraulic control; and a box-type single-member frame, high-arched for maximum blade adjustment. Standard equipment includes hand steering with a hydraulic booster, and large front tires the same size as the rear tires. Available as extra equipment is a hydraulic, shiftable moldboard which permits a maximum extension of the blade 103 inches beyond the rear tires with a 13-foot moldboard. Weight of the grader is from 23,560 pounds up, depending upon extra equipment.

Further information on the Model 118 grader may be secured from the company. Or use the Request Card at page 16. Circle No. 454.

Ice Control by Sanding

A catalog describing the Anderson Type H sand spreader for control of icy roads has been prepared by Anderson Engineering Co., 229 Bent St., Cambridge 41, Mass. It emphasizes the fact that the rig spreads sand in front of its rear wheels, so that it is not necessary to back up hills and grades when the worst conditions prevail.

The 6-cubic-yard hopper has a screw conveyor, making it self-unloading. The drive to the screw feeder and disk shaft is through a completely sealed gear case. The folder also points out that standard equipment includes a separate-engine clutch control by air or mechanical linkage. Cab control of the separate engine enables a quick start and stop in spreading, the company says. The catalog provides photos of the spreader and a side-elevation drawing.

This literature may be obtained from the company by requesting Bulletin 205. Or use the Request Card at page 16. Circle No. 503.

Highways for Puerto Rico

Puerto Rico plans to spend more than $9,000,000 for highways. Federal-Aid funds will account for $5,462,332.69 of this amount; $4,067,915 in municipal funds will also be spent.

Federal-Aid projects, with approximate costs include two first-class highways at an approximate cost of $624,230; nine second-class highways at $1,855,586.38; and three urban projects at $2,982,916.31.

The Puerto Rican Department of the Interior plans nine projects at a total approximate cost of $100,000. Seven districts plan projects with estimated costs as follows: San Juan, eleven projects at $481,500; Arecibo, twelve projects at $324,015; Aguadilla, fifteen projects at $671,900; Mayaguez, sixteen projects at $722,500; Ponce, eight projects at $610,000; Guayama, twelve projects at $523,000; and Humacao, fifteen projects at $635,000.

Further information on these projects may be obtained from Jesus Benitez Castano, Commissioner of the Interior, San Juan, Puerto Rico.

Bridge Piers Sunk Through Deep Mud

Unusual Design Makes Use of Deep Mud For Lateral Support Of Substructure Columns and Towers

• "THE bridge without precedent", with foundations that go 330 feet deep beneath Blue Creek Bay of Idaho's Coeur d'Alene Lake, is under construction. Residents of the north Idaho city of Coeur d'Alene are waiting anxiously for the day when the $1,000,000 structure is finished, and the straightened lines of U. S. 10 hook on to each abutment.

Paul Jarvis, Inc., of Seattle, is pushing the construction of the 1,297.75-foot bridge under a $871,555 contract with the Bureau of Public Roads. The Idaho Highway Department does not enter officially into the picture, because the work is a part of the Idaho Forest Highway System on Federal land. Jarvis has until next July to finish.

Constructed partly from falsework and partly from floating equipment, the bridge is especially unique because of its design. Its columns supporting the towers extend as much as 330 feet below the deck. Blue Creek Bay is a deep arm of the lake. Underneath its deep creek water is 25 feet of mud bottom, a shallow layer of solidified mud, and then a deep layer of mud extending down to bedrock far below.

Some idea of the depth can be obtained by comparing the column of tremie concrete with that on Tacoma Narrows and the San Francisco-Oakland Bay Bridge. Maximum column here was 340 feet. At Tacoma Narrows it was 224 feet; and 218 feet on San Francisco-Oakland.

Bridge Design

The bridge is designed for H20-S16-44 truck and lane live loading, with maximum impact of 30 per cent. Wind-load is figured at 500 pounds per foot of span. The 6½-inch reinforced-concrete deck, 28 feet wide curb to curb, is designed to carry a dead load of 81 pounds per square foot. No allowance was made for future surfacing.

The bridge is 1,297.75 feet long, center to center of end bearings.

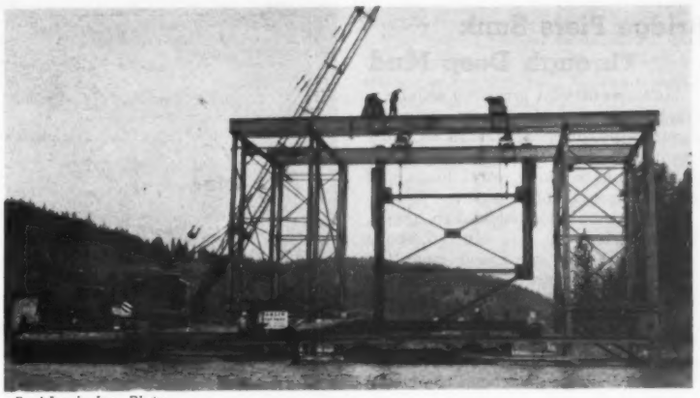
The substructure consists of 7 structural-steel towers, which are primarily four 24-inch cylinders with structural bracing. The tower cylinders are separated by 18-inch drilled-in casings, which extend into bedrock. Structural-steel column cores, of 10-inch BP 57-pound material, extend from bedrock to the tops of the towers. The 24-inch tower cylinders and the 18-inch casings are filled with concrete.

The towers are a uniform distance of 152.5 feet apart.

The deck consists of five longitudinal steel girders 54 inches deep, with tower and cantilever spans alternating with suspended spans. A 6½-inch reinforced-concrete deck will rest on the girders. There will be a 2-foot safety curb with an aluminum-alloy rail on each side of the roadway.

Step 1: Getting "Set"

The first step in the construction of the bridge was the installation of the seven towers. At first, Jarvis believed that a hardpan ledge 25 feet down in the mud would hold driven falsework, but the "hardpan" proved to be merely a shallow 1½ to 3-foot layer of consolidated silt. Its bearing value was poor, and three of the towers had to be erected by unusual floating falsework. The falsework for towers 2 and 6 had to be carved through the mud to rock.



Paul Jarvis, Inc., Photo

Here is the start of the lift on the south side of tower No. 7 of the Coeur d'Alene Lake Bridge. North and south sides were barge-assembled, then hoisted by crane into their places inside of the falsework tower, and transferred to the winch hangers. East and west frames were then fitted in.

Each tower extends from about 20 feet below the mud line to the bottom of the deck, to make a bracing system for the composite columns which support the superstructure. The tower

(*Continued on next page*)

Bridge Piers Sunk Through Deep Mud

(*Continued from preceding page*)

bracing systems do not carry any superstructure vertical loads, as they might be considered to do. The towers do function to carry wind loads and other horizontal forces.

Each tower is four stories in height. The bottom story was erected above water by being suspended from the falsework. That portion of the tower was then lowered into the water, and the following two stories were erected and lowered in succession. The top story was left off until the drilling and composite column had been completed to a point above the water line.

The two barges which carried the floating falsework were tied together, with a 40-foot space between. Atop the steel falsework were four Beebe 15-ton hand winches, which permitted the towers to be lowered at each corner by ¾-inch cables.

A 503 Koehring crane on a 36 x 70-foot pontoon barge, and a Northwest truck-crane on a 28 x 41-foot pontoon barge, were available for handling the tower steel.

Ordinarily the north and south sides of the bottom section were barge-assembled first, then hoisted by crane into their places inside of the falsework tower, and transferred to the winch hangers. The east and west frames were then fitted in, with the necessary horizontal bracing. This section was then lowered into the water far enough down to erect the second section. This was then repeated until the tower was complete except for the top 14 feet 11 inches.

The tower was lowered until the bottom of the 24-inch tower legs had reached the mud. It was carefully spotted into position by 1½-inch set screws held in position by channel irons welded to the falsework. The floating falsework was carefully anchored during this move, and a good survey triangulation network assured a tolerance of only 3 inches laterally and longitudinally.

The initial accuracy of the tower was of prime importance. Accurate location was necessary not only from the standpoint of deck accuracy, but also because the tower was used as a template for the placement of 18-inch casings later on.

Due to the resistance of the last 10 feet of mud over the hardpan, tower sinking was at first a slow process. The mud proved to be a blessing, though, for it was strong enough to support the towers which were erected from the floating falsework. To help get the first tower down, an ordinary vertical jet pipe was used. It took 6 days to get the tower down. Then Jarvis got the idea of using 2½-inch perforated-pipe jets on the underside of all bottom struts, and turning two Chrysler-driven pumps on. That did the trick, and the rest of the towers went down in about 6 hours.

Step 2: Setting 18-Inch Casing

The 18-inch-diameter ⅜-inch mild-steel casings were assembled by welding 20 and 40-foot sections together as they were lowered into position through the 24-inch tower legs. They lowered true to line, because guide bars were welded inside the tower legs to keep them centered.

The casings sank into about 25 feet of mud from their own weight. They were then driven by a small drop hammer through the hard layer of mud on down to rock line. On pier 2, with about 100 feet of mud, it took 5 days to install the 18-inch casing, including time for dropping the sections in, and welding.

Drilling

When the casing reached rock, the next step was drilling a hole into solid rock. A Model 72 Speed Star churn drill, mounted on a timber barge, was used for this purpose. The average depth of drilling into rock was about 27 feet. The casing was driven down as drilling progressed, until the bottom of the casing was within 10 feet of the bottom of the drilled hole. Here the casing stopped. The bottom 10 feet of the column is without casing in order to bond the concrete to the rock for transfer of load.

Paul Jarvis, Inc., Photo

A Chrysler outboard-powered barge takes on a load of concrete for the Coeur d'Alene Lake Bridge. Paul Jarvis, Inc., of Seattle holds the $871,555 bridge contract.

A bailer and a small sand pump then cleaned out the hole.

Casing Is Cut Off

In order to salvage a portion of the 18-inch casing, it was designed to be cut off about 20 feet above the bottom of the tower legs, giving an adequate splice between the casing and the tower leg. Since the cutoff point was deep down under water, a cutter had to be developed.

A 4-wheel cutter was designed, and was used most satisfactorily. Expanding tapered swedges held it in position, and men turned the device from up above by chain tongs. Ordinarily the ⅜-inch steel was cut in about an hour.

The steel core, a 10-inch BP 57-pound section, was now assembled by splicing 60-foot lengths with butt welds. Welded flange splice plates were also used. The heavy steel core was lowered into the column until it bore on solid rock. The steel core was cen-

(*Concluded on next page*)

tered in the column by means of guide lugs, welded to the steel core at 20-foot intervals.

Concrete Work

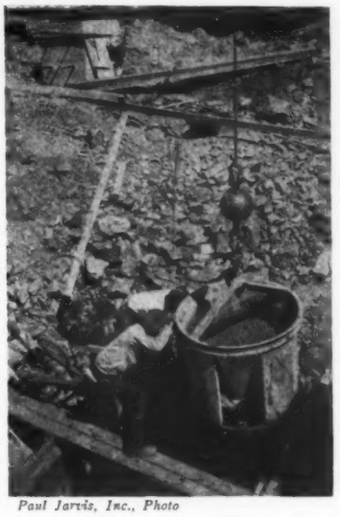
A small Winslow Binanbatch plant was used for the proportioning of three sizes of aggregate, sand, and cement for the concrete mixture. Aggregates were trucked in, as was bag cement. A Koehring 304 crane charged the plant hoppers when a concrete pour was in progress.

Weighed materials from the plant passed to a traveling hopper, which dumped into the skip of a 14-S Rex mixer. Mixing water was taken from the lake just below the plant, and Darex air-entraining agent was added to obtain about 4 per cent of air entrainment. The mixed material chuted down to pontoon-mounted hoppers which carried it out to the point of placement.

The 18-inch casing and the 24-inch tower cylinders lap 20 feet, creating an annular space between them. This was filled with grout, thus connecting them by the bond of the grout and the steel surfaces. This grout was placed by the ordinary tremie method, through a 2-inch pipe. A wooden traveling plug forced through the pipe by the concrete was used for charging the pipe column. In order to avoid any overflow which might drop down to the bottom of the hole, grouting stopped when it was within 2 feet of the top of the 18-inch casing.

Before the column concrete was placed, all silt was removed by a water jet pump hooked to the concrete-placing pipe. Ordinarily this brought up a boiling flood of muddy water, but as the washing continued and the stream cleared, the hole was cleaned. It was then sounded to make certain it was clean to solid rock.

The concrete was actually a grout, 1 to 3 mix, with ⅜-inch maximum-size aggregate and an 8-inch slump. It was placed through a 3-inch tremie pipe—later changed to 4-inch to speed up the work—which had an air-operated valve at the lower end to control the discharge.



Paul Jarvis, Inc., Photo

A Gar-Bro concrete bucket makes a bridge abutment pour.

The tremie, when in position, was filled with water. It was charged by forcing a wooden plug through under pressure of the concrete. After being charged, the pipe was kept practically full until all of the concrete had been placed. The concrete was fed into the column as desired, but at all times maintaining a head of concrete above the valve of not more than 20 feet below the water surface. The process of pouring was delayed about 20 minutes while a length of pipe was being removed and another batch of concrete hoisted in position. One 191-foot column, No. 2, was filled in 5 hours.

BPR engineers consider the valve-control method far superior to the ordinary tremie, which often loses its charge. Loss of charge in an 18-inch column 340 feet high could have been disastrous.

Deck Construction Routine

The construction of the deck steel will be strictly routine, and the barge-mounted cranes will swing it into position rapidly. The only trouble with steel was a steel strike which delayed the arrival of the steel for about 90 days.

Paint on the towers gave a bit of trouble by "alligatoring" under exposure to the sun. Defective surfaces were repainted, and where the steel was to be submerged, the surface was whitewashed. This method was quite effective. Consolidated Western Steel Corp. of Los Angeles, fabricated the towers, and the Alameda, Calif., plant of the same concern fabricated the 18-inch casing.

Coeur d'Alene's worst winter in years put a heavy ice coat over Blue Creek Bay, which did not break up to permit work to start until March 15. Once the Larvis organization got going, however, the towers went in speedily. It was expected that the last tower would be finished by September 15, and that cap plates and girders might be finished before the winter freeze.

Paul Jarvis, Sr., President of his organization, and his son, Paul, Jr., supervised the field work, assisted by Al Hyde.

For the BPR, W. H. Lynch at Portland is Division Engineer, R. B. McMinn is Senior Highway Bridge Engineer, and John Zoss is Resident Engineer.

Plans were prepared by the western headquarters of the BPR, San Francisco, Calif., on recommendations made by the Division Office as to type of structure.

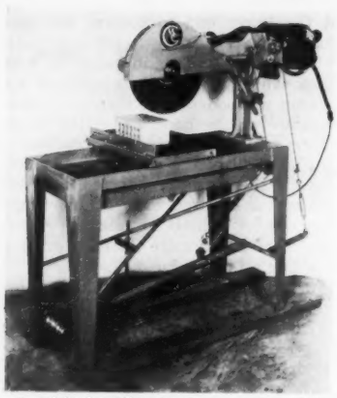
Pipeline Construction

A new bulletin issued by Thew Shovel Co., Lorain, Ohio, features the application of Lorain power shovels and cranes to pipeline construction. Special attention is given to the Lorain Pipeliner, a specially designed hoe with wide-gage crawlers to straddle pipeline ditches. Application of other types of Lorain equipment such as clamshells, draglines, and cranes is also depicted. The story of the use of rubber-tired Lorain Moto-Cranes for pipelining, and their efficiency on widely separated spreads is also included. The title of this colorful and fully illustrated 12-page book is "Lorains on Pipeline Construction".

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 419.

Reynolds Man Assists Gov.

Eric W. Hammarstrom, Manager of the Building Products Section of Reynolds Metals Co., Atlanta, Ga., has been granted a leave of absence to join the Building Products Division of the National Production Authority in Washington, D. C. He served the WPB during World War II.



A unitized cutting head, arm, and motor make it possible to align the blade of the new GMC masonry saw in relation to the cutting table.

A New Masonry Saw

A new masonry saw for wet and dry cutting has been announced by Construction Machinery Sales Co., Glenwood & Vinton Aves., Waterloo, Iowa. This new unit, the company says, employs a design that utilizes the cutting head, arm, and motor so as to permit alignment adjustments off the rigid column, mounted directly to the jig-welded steel frame. This makes it possible to align the blade in relation to the cutting table, thereby greatly increasing blade life.

The new unit has an independent centrifugal pumping unit complete with its own power, used to circulate the coolant liquid during wet-cutting operation. This, CMC explains, eliminates all belt drive, power takeoffs, and consequently increased load on the motor driving the cutter blade. To minimize damage to the impeller and case of the pumping unit, from the possible abrasive action of the coolant liquid, both these parts are made of wear-resistant rubber. Other features include smooth-operating foot feed; indexed adjustment for control of cutting height; locking arrangement for plunge cutting and scoring; V-shaped ball-bearing-equipped material-feed cart; and cast-aluminum cutting arm and column.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 404.

Portable Air Compressor

A 30-cubic-foot portable air compressor is described in Bulletin H-850-B72, issued by Worthington Pump & Machinery Corp., Harrison, N. J. This two-stage air-cooled compressor has a maximum operating pressure of 150 pounds. It is equipped with an ASME air receiver, oil-bath air cleaners, and protective V-belt guard.

Features pointed out in the literature include circumferential cooling fins; tube and fin-type air-cooled intercooler; positive by-pass unloader which holds the inlet valve open during idling period; Worthington feather valve; separate close-grained cast-iron honed cylinders; full-floating wrist pins; oil dippers for controlled lubrication; aluminum low-pressure piston; and cast-iron high-pressure piston of equal weight for proper balance. The compressor comes in either a trailer model having an overall length of 74⅝ inches or a hand truck model with an overall length of 65 inches.

This literature may be secured from the company. Or use the Request Card at page 16. Circle No. 476.

Contractor Wins Largest Single Job Ever Awarded

F. H. McGraw & Co., Hartford, Conn., has walked off with the largest single construction contract ever awarded to a construction company—a $350,000,000 plant for the Atomic Energy Commission at Paducah, Ky. It will take more than two years to complete and nearly 10,000 men. The company's Vice President Donald W. Neville will head up the project. Paul F. Pape will serve as Project Engineer, A. A. Persson will be Project Manager, and Hinman Root will be Chief of Purchases.

The Bicknell air-operated utility tool shown routing out old mortar preparatory to waterproofing.

Air-Operated Hammer

A new air-operated hammer designed to work with wood, stone, or metal has been developed by Bicknell Mfg. Co., Rockland, Maine. This hand-held utility tool may be used with a variety of chisels, pointers, star drills, etc., to work on stone or masonry, remove paint and scale from structural steel, bush concrete, and do light metal chipping. The tool is 8½ inches long, weighs 4 pounds, and has a positive tool retainer. The accompanying illustration shows the hammer being used for digging out old masonry joints preparatory to waterproofing.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 403.

Circular on Asphalt Kettles

A 2-page circular describing the Heet-Master Road Builders asphalt kettle has been prepared by Aeroil Products Co., Inc., South Hackensack, N. J. This unit is designed in two models with a capacity of 175 or 230 gallons. The literature illustrates and describes the kettles, and gives complete specifications and information on all features.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 424.

The Kelite HD Model S steam cleaner has a capacity of 300 gallons of vaporized solution per hour—enough to operate two or more guns at high velocity.

New Steam Cleaner Can Deliver 300 GPH

The new HD Model S steam cleaner made by Kelite Products, Inc., Box 2917, Terminal Annex, Los Angeles 54, Calif., has a capacity of 300 gallons of vaporized solution per hour. This capacity, the company says, results from a Kelite development called the "water wall"—42 feet of tightly coiled ¾-inch pipe located at the point of greatest heat radiation—and is sufficient to operate two or more guns at high velocity. Altogether, 330 feet of heavy-duty ¾-inch pipe is used in the water jacket. The steam cleaner is available in gas-fired or oil-fired models featuring safety fuel shutoff, high-velocity nozzles, and Ke-Seal drain valves.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 542.

The Methods of Planning For Structure Foundations

The preface to the new text "Foundations of Structures," authored by Clarence W. Dunham, Associate Professor of Civil Engineering at Yale University, offers an excellent review of the object of the text itself. In it Professor Dunham says, "The planning of foundations for structures is more of an art than a science. The conditions at any particular site must be taken as they are . . . the engineer . . . must use whatever soils are already there, or he must devise ways to improve the situation in the interest of safety and suitable economy."

The author rightfully feels that it is impossible to set up rules, regulations, and detailed recommendations for the solution of all the problems that arise in the planning of structures. There are, however, many basic principles that may be helpful in such matters, and he has endeavored to present some of these and show their applications in specific cases. Though he has not attempted to write a textbook on soil mechanics, he has illustrated and described most soils problems encountered in ordinary construction and related them to their influence on foundations.

The new text is intended for young engineers and those of limited experience. The problems are worked out numerically so that the person studying foundation on his own can understand the engineering data and the computations involved. In the detailed designing and analysis the author uses approximations which he feels are conservative and, in view of the many broad assumptions made in foundation planning, are both reasonable and satisfactorily economical.

The approach that Professor Dunham suggests for the young engineer is to learn all he can about the conditions at a given site, and then determine the types of foundations that are practical for this job. He should then sompare their cost, suitability, ease of construction, and safety—adopting the foundation which in his judgment is the best. After that he may proceed with the detailed parts of the design. Repeatedly the author tries to show the reader how to size up a situation and how to tell which of several alternatives is the best.

"Foundations of Structures" contains 679 pages and is fully illustrated with both photographs and engineering drawings. It is available from the McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y., at a cost of $7.50.

Folder on Pipe Cutters

A 4-page folder describing a variety of cutters for pipe sizes of ⅛ to 12 inches has been offered by Ellis & Ford Mfg. Co., 2423 Goodrich Ave., Ferndale 20, Mich. An all-purpose cutter for work on pipe in or out of a ditch, the Ellis cutter is made in two sizes: one 4 to 8 inches and the other 4 to 12 inches. The literature points out that every point in contact with the pipe is a cutting disk, and the tool needs only to be moved in a small part of a circle in order to cut entirely around the pipe.

The Barnes-type and Saunders-type cutters described in the folder are for cutting pipes ranging in size from ⅛ to 4 inches. A full line of cutter wheels is also presented.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 473.

Three Contracts Keep A Crane on the Move

A little over a year ago F. H. McGraw & Co. of Hartford, Conn., landed two contracts in Ocala, Florida. One was for a $256,715 water-treatment plant in the center of the town and the other for a $416,490 sewage-disposal plant on the outskirts. Then in June, 1950, the company was awarded the Marion County War Memorial Swimming Pool job in Ocala for $32,244. All were lump-sum contracts.

Definite job economies have been achieved by using a single rubber-tired crane to serve all three jobs. Under normal conditions a crane would have been required for each location, since the contracts included such operations as excavation and backfilling of trenches and structure foundations; setting cast-iron, vitrified-clay, cement-asbestos, and corrugated-metal pipe and fittings in trenches and structures; setting all process equipment; placing concrete; loading slag on conveyors for placement in the trickling filters; and loading and unloading railroad cars.

A rubber-tired Lorain Moto-Crane places Infilco wash troughs in filters on F. H. McGraw's water-treatment plant contract in Ocala, Fla. When the placing is finished the crane will head for one of the two other McGraw jobs in the city.

The water-treatment plant was only about 2 miles from the sewage-disposal plant, and the company decided to use a rubber-tired Lorain Moto-Crane and schedule the crane work so that it could cover the route between the jobs and give each adequate service. When the swimming-pool contract came along the work was scheduled so the crane could cover it too. This method, which turned the usual idle time into productive time, worked very well and the crane now covers the route between the jobs about three times a week. Its schedule is of course subject to variation if emergencies develop.

Mechanical Brain Speeds Traffic Counts in Jersey

For its traffic counts, the New Jersey State Highway Department has pressed into service the "mechanical brain" of the electric accounting machine. Developed by the Department's Planning, Traffic, and Economics Division, the new system is saving 90 per cent over older traffic-check methods. According to Commissioner Ransford J. Abbott, the Bureau of Public Roads is now urging other states to adopt the idea in the interests of accuracy and efficiency.

The most recent traffic study using the technique was in Camden County, preparatory to modernizing the intersection of Routes 42 and 45. Every motorist entering the modified circle during the two-day survey received a card upon which had been prepunched the hour of entrance, point of entrance, and type of vehicle. When he left the intersection the driver surrendered the card to a Department representative. The cards gathered at each exit point were kept in separate hourly groupings; thus it required only a single operation back at the home office to punch this information on some 80,000 cards. Then the electric accounting system took over.

Formerly it took a group of experts weeks to analyze the information gathered from these field surveys. By combining the card-punch system with the electric accounting machine, this time is now reduced to hours, Mr. Abbott says.

Warning Torches, Lanterns

A new 4-page folder describing a complete line of torches and warning lanterns for use by contractors and highway departments has been prepared by the Embury Mfg. Co., Warsaw, N. Y. All products are illustrated with 2-color photographs, and complete specifications are listed. The products include both spherical and flat-base highway torches; six different warning lanterns with capacities for burning up to 100 hours; and replacement parts such as globes, filler caps, wicks, and burners.

Features of the torches include a large opening for easy filling, a ring chain for carrying and placing, a rain-shedding hood, and a threadless cap that will not strip. According to the folder, the torches will stay lit in any type of weather.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 409.

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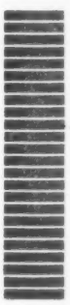

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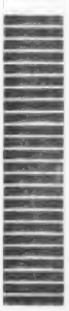

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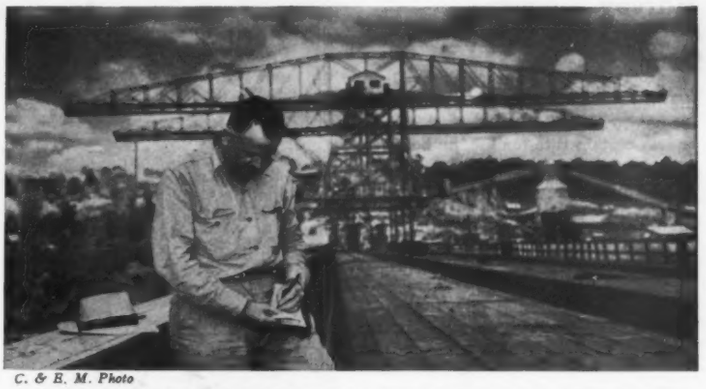
Portrait in Print

By RAY DAY

Harvey Slocum: Dynamic Dam Builder



C. & E. M. Photo

A Harvey Slocum "Damogram" in preparation—a typical shot of Slocum atop the trestle at Bull Shoals, jotting down a sour note in his little black book.

• THE girl at the Western Union office desk glanced at the blistering words and then up into the mild brown eyes of the slightly graying man whose stubby fingers beat a light tattoo on the railing.

"Why, Mister Slocum, I can't send this," she said. "You'd have the FBI on your front doorstep by morning."

The little man grinned, and his voice took on a steely tone as he rasped, "Send it. I'll take care of the FBI."

Next day they said, "Mister Slocum sent a telegram to President Truman! He isn't afraid to criticize anybody!"

This somewhat less-than-profound conclusion, reached in Mountain Home, Ark., would come as no surprise to many superintendents, powder monkeys, engineers, and construction stiffs all over the country. I seldom visit a dam or other heavy-construction project anywhere, especially in the far west, without being asked, "You get around; where's old Harvey?"

The question is always asked in a voice full of respect.

"Old Harvey", who is not old and whose signature doesn't spell out his famous name, is building a dam somewhere. He is also carrying on with himself, with his engineers, or with his government a good-natured fight. He is busy expressing approval or disapproval. He is reading of engineering, construction-technique advances, astronomy, and the *Police Gazette*. He is picking up scrap metal and other debris around his job, writing numerous letters to his wife, Helen, out in California, and planning nice things to do for his men.

All these he will be doing simultaneously. Nobody seems surprised when I give them this explanation.

Born Leader

For Harvey Slocum, builder of dams like Grand Coulee and Friant, is a man of many accomplishments. If there is such a thing as a born leader, Slocum is it. According to literally hundreds of high construction-engineering officials, among them Stanley Bent, President of Bent Construction Co. in Los Angeles, Harvey Slocum with his unusually broad grasp of engineering projects is easily the most outstanding construction man in the world today.

Slocum's reaction to that statement will likely be quite typical of his innate modesty which so far has made his name and picture practically impossible to get in a construction magazine. His reaction will consist of two short Anglo-Saxon words, spoken explosively, which the more prissy of our social element would not utter.

For Harvey Slocum is, beneath his traditional khakis and simple exterior, a complex package. You recognize his fine, direct mind, and you note his knowledge of his business and the complete acceptance of responsibility. You see and like his sympathy for his fellow men. You admire his fearlessness, and you wish you had his curiosity. But you don't try to dissect him. Harvey Slocum is a man you take in toto.

He exemplifies the growing theory that the world's only aristocracy is

(*Continued on next page*)

Harvey Slocum—Dynamic Dam Builder

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the one of brains. The human mind is set before birth to tick along at a more or less certain rate for life, he believes, and no amount of buffing of a dull one against a modern university will produce a perfect polish. Good minds occur in every race at roughly the same ratio, Slocum says, and he believes the salvation of the world depends on how well those minds are exercised.

His own in action is outstanding. It casts out the complex or reduces it to a series of small, clear problems. Slocum doesn't need concrete-production reports to know what yardage is being placed. He drives past the aggregate piles at the batch plant and forms his own incredibly accurate estimate at a glance by the way the piles are going down.

When his project engineers got worried about the theoretical loading of heavy dam machinery on a warehouse floor, Slocum grinned and said, "I've been watching that, too, but you can put another 50 pounds to the square foot before you stop."

A crusader for honesty and common sense in government, Slocum has more than once turned the products of his mind to the discomfiture of governmental representatives, not necessarily connected with his dam projects. With characteristic directness, he believes that no American has the right to criticize his Government freely unless he takes an active part in it and contributes to the campaign funds of good statesmen. Many of his well-thought-out conclusions reach Washington, D. C., and state capitals in letter form or by telegram. He has contributed what he could to the campaign funds of men like Senator Taft of Ohio, Senator Fulbright of Arkansas, Nixon of California, and many others, although Slocum is himself a Californian.

No two leaders ever commanded universal respect in exactly the same way, he believes. His own brand of leadership is a little unique. It is the old-fashioned kind. Dam builders on a night shift on Harvey Slocum's jobs sometimes say, "Well, I sure don't know what he's thinking about to order this done, but we'd better go ahead and do it that way because the Old Man knows his business."

The secret of this kind of compliance is Slocum's vast knowledge of dam construction, and the acceptance of his own responsibility. For he is quick to take full blame for his orders if things go wrong, and just as fast to give underlings the credit when things go right.

On one of his early dams, for example, Slocum had given the paymaster orders to disburse payroll checks in a way that called for men to line up in front of the office window. It saved cluttering up the office. It was Slocum's idea to produce efficiency and save the men time in getting their checks. But one burly IWW organizer either misunderstood or seized the opportunity to foment what unrest he could. He made a loud and caustic comment directed at paymasters in general.

Slocum was standing nearby, out of sight, and in a few well chosen if blunt words he set the man straight, finally getting around to pointing out that the lineup was the result of his orders; not the paymaster's.

Smarting under the General Superintendent's penetrating brand of invective which had made an ass out of him before the rest of the men, the big man said, "Mister Slocum, you wouldn't dare to talk like that to me outside the protection of your office."

Instantly Slocum acted. It was almost automatic. Diving over the paymaster's head to get out of the office, he scat-

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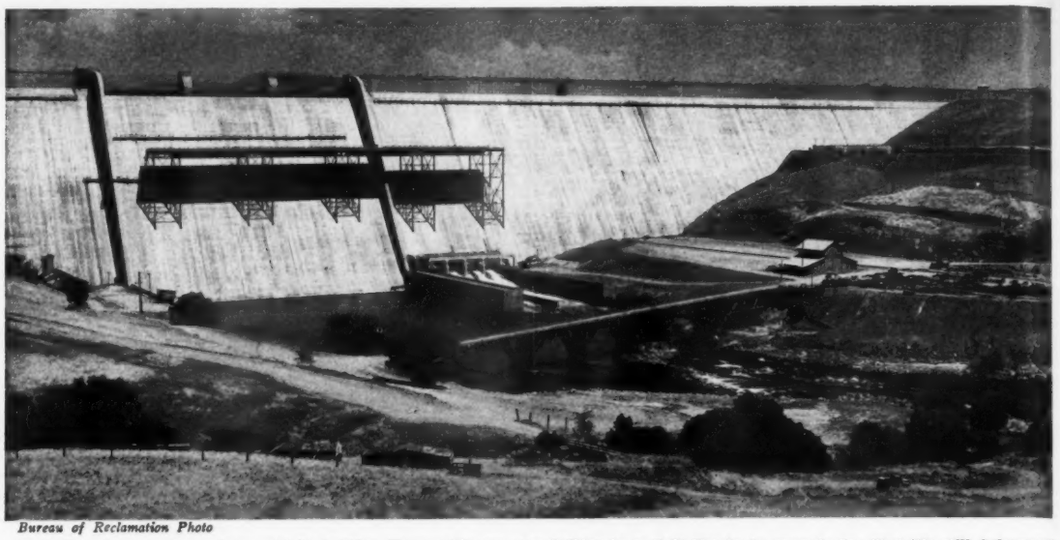


Bureau of Reclamation Photo

Both Friant Dam, shown here, and its builder, Harvey Slocum, are Californians. Bull Shoals, he says, is fine "but it's still Arkansas".

tered payroll checks behind him and fairly crawled to his feet in fury. The big man was no longer present. "I'm leaving! . . . I'm leaving, Mister Slocum!" he yelled, racing down the railroad track and onto the observation car of a passing Yosemite Valley train. Slocum chased the man out of sight while the men laughed until their sides ached.

Without Fear

He is a man without apparent fear. At Grand Coulee Dam during a life-and-death emergency he called for volunteers to go down in a deep shaft, promising first of all, "I'll be there with you." At Exchequer he personally took a steam shovel across a flimsy trestle everybody figured would buckle, including the regular operator who abandoned the machine. At Bull Shoals, where he is today, he nonchalantly placed himself in a position of danger as he led the rescue from death of a man who had been caught at the bottom of the feed cone of an aggregate pile.

C. & E. M. Photo
Much of a dam superintendent's work is administrative. With the familiar half-smile which thousands of construction stiffs know, Slocum takes a sheaf of papers from his secretary, Dora Reynolds.

"I have seen him run nimbly along on the old concrete chutes we used to use, maybe 150 feet in the air, completely oblivious to any sense of fear," said one contractor.

Sympathetic

As noticeable as Slocum's fearlessness is his intense sympathy for the problems of other people. Last year when labor disputes plagued the work at Bull Shoals Dam, pickets encircled the project. The weather was cold and dreary, and nobody realized better than Harvey Slocum that most of the men who were out of work were uncomfortable and hungry.

He set up small, weatherproof shacks for the pickets to use at all the principal points of entrance to the job. He installed stoves, and occasionally he financed hot lunches or sandwiches for the very men who picketed his project. He loaned money to some of the men who were out on strike and got to be known as the softest touch and the kindest man in Arkansas. It might have been a case of turning the other cheek to extremes, but "The Little Fellow" had been through the mill and he knew from firsthand experience the personal problems of his men.

Inventive Genius

Wherever you go where dams are built, you hear many a favorable comment about Slocum's inventive genius, particularly in the field of new methods of doing construction work. The freezing of an entire mud slide at Grand Coulee Dam is cited as an example. Press Slocum for an explanation and he will tell you long and loudly that the credit isn't well founded.

"Christ Almighty!" he explodes in that clear voice which takes on a steely rasp when he is disturbed. "I don't deserve credit for that idea, and neither does Henry Kaiser or some of the other people who got it.

"Francis Donaldson, Chief Engineer for Silas Mason Co., had written a book on ground freezing as a method of stabilization in mine shafts. The idea was proposed by Donaldson for use at Grand Coulee, and all I did was to accept it when it came to me. That doesn't take genius!"

What Slocum fails to mention is that he had read Donaldson's book the same as he reads anything he can lay hands upon. His curious, open mind is crowded with odd bits of information which help to get new ideas accepted and put to use. At the same time he clings to time-tested ideas which have proved their worth. He likes cantilever-type cranes, for example, because they have produced for him some remarkable records.

Slocum's method of building a dam is peculiarly his own. His planning is always months in advance. When he first walks out on a dam site, he has an uncanny knack of visualizing immediately not only the location of the dam, spillway, outlet works, and powerhouse, but the location of his own shops, office headquarters, and storage warehouses.

He plans the work, even today, in such a way that materials and machinery move in to the site in an orderly sequence as they are needed, and if possible go directly into the dam without a period of storage and secondary handling. Present-day uncertainty of the delivery date on many items makes storage more necessary, and Slocum's warehouses are models of order which reflect another odd quirk of his make-up. He is so orderly that he habitually picks up nails, small bits of debris, and other unsightly things around his job, arranging most of the material in neat piles. When he bought a new Cadillac last summer one of the men who knows this tendency of Slocum's said, "He'll

(Continued

Harvey Slocum—Dynamic Dam Builder

(*Continued from preceding page*)

have the back end full of scrap iron in two weeks."

Frequent Job Conferences

One of the things Slocum learned early about the management of dam construction was the necessity for frequent conferences. Once a week or oftener he holds meetings of all key foremen and sub-superintendents. "It gives me a chance to learn what's going on, and shows everybody else what we're shooting for," he explains. "The excavation superintendent is there to hear me set concrete schedules, so he knows it's not simply a case of the concrete boss pushing him around when he's asked to hurry up and get his dirt work done."

Actually, one of the last things Slocum needs is a conference to tell him what's going on. He visits every part of his job at least once a day; sometimes more. Every nook and cranny is mirrored in his photographic eyes, and sour details go down immediately in a little black book he always carries. These he irons out direct in the conferences or by means of Harvey Slocum "Damograms". There is little that he does not see. His jobs are characterized by orderliness, efficiency, and the best machinery money can buy.

"A piece of machinery is something personal to Harvey," said one contractor who especially respects the man's genius. "If he has one fault to his name, I'd say it was extravagance in the selection of fine equipment. But how that man takes care of a machine once he talks you into getting it!"

Slocum's "Damograms" are, so far as is known, original with him. They consist of urgent messages, culled from his little black notebook and transferred to odd bits of scrap paper. Slocum's "postoffice" has a pigeonhole for all key foremen and supervisors. When he writes a Damogram he never forgets it, and if a foreman fails to take immediate action on the Damogram suggestion, he will find himself shortly in the position of being asked why.

Biographically Speaking

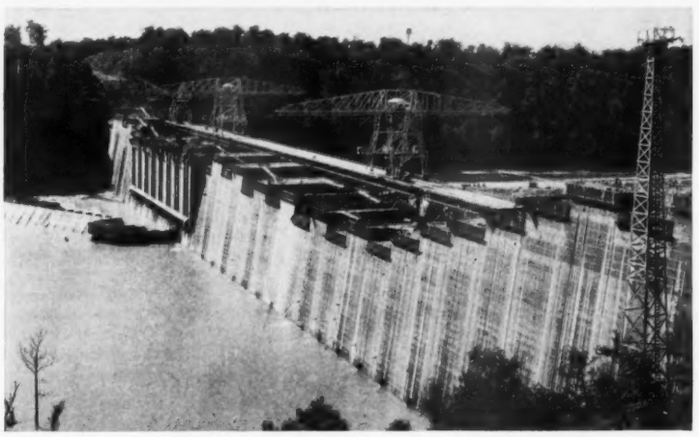
M. H. Slocum was born October 23, 1887, at National City, Calif. His formal education ended with the elementary schools there, and he began his habit of reading and studying to obtain his undeniable broad education of today. He worked at odd jobs, finally landing on Lake Hodges Dam near San Diego. He rose rapidly to become Assistant Superintendent and was soon on his own. He has supervised the construction of 15 major dams in his lifetime.

Slocum's early start as a self-made man in the rough, tough construction world of 40 years ago generated within him perhaps his biggest battle, and provided him his greatest personal victory. It has been 12 years since Slocum took a drink of whiskey. It is a tribute to his intelligence and ability for accurate self-appraisal that he reasoned out for himself his decision to quit.

There was a day when Slocum could drink, eat, and fight with the best of them. Later on, as General Superintendent, he sometimes demonstrated his capacity in that regard. It didn't go too well with responsibility, clear judgment, and Slocum's undeniable love for building things. He was fired from Grand Coulee after whipping the toughest river diversion ever attempted, and ejected from Madden Dam in Panama under similar circumstances.

He is entirely likely to take a dim view of the praising parts of this Portrait, but of this battle he won, Slocum says, "Goddammit, write it. It's part of the story."

A contractor in position to know



Bull Shoals Dam at Mountain Home, Ark., is Slocum's current project. He has supervised the construction of 15 major dams in his lifetime.

his job because he wanted to, or felt he had to. He did it purposely to get fired, because it was his way of objecting to things he did not like which they were asking him to do."

Be that as it may, he realized that his career was in danger 12 years ago, and stopped then and there. Lately he has watched his diet carefully and trimmed himself down to top-notch physical shape. He is a youthful-looking man today, with every bit of the old fire and a zest for living. When Harry Morrison, President of Morrison-Knudsen Co., Inc., visited Bull Shoals Dam recently, he followed it through with a warm letter expressing his appreciation of Slocum's know-how.

His opinion of the area around Bull Shoals Dam is typical of his uninhibited repartee. Remembering some of the beautiful California country in which he has built dams, I asked him how he liked it at Bull Shoals by comparison. His reply: "It's heaven, but it's still Arkansas!"

At the present time he is counting the months until Bull Shoals is finished and he can return to California or accept leadership for India's Bakru Project now being negotiated. Bull Shoals, embodying practically every advanced

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principle in concrete technique, is moving ahead rapidly on schedule.

When Leslie V. Miller ran an article critical of dam building in the *Saturday Evening Post,* Harvey Slocum's letter of commendation was one of the first to reach the author. For Slocum had realized that truths had been told in the story; truths which sometimes reflect his own views on dam building.

Slocum Sayings

If dam construction faces but one real danger, he believes, that danger is extremes in design without regard for costs. He has originated a pointed little question, with regard to expensive cheesecake and other falderal, which invariably makes designers squirm. "How many cubic yards of concrete does it have per opening?" he will ask, speaking of a dam or spillway or powerhouse. Unless the design measures up to the high standards of Hungry Horse or Pine Flat, he is likely to snort his contempt in a nice way the designers respect.

Other Slocum sayings in a nutshell are: "A good superintendent is just a contractor with one job." And "Hiring out is like shooting craps; you simply bet your life and career on the way you perform." Or "The biggest disappointments are the bets you make on other men that don't pan out."

He can take a major disaster like the accidental burning of a $100,000 batch plant calmly and quietly, but petty boners sometimes excite him to fighting fury. His explanation for this, too, is short. "You can't help the big disasters," he says, "but by God there's no excuse for the little ones."

Aside from his part in America's dam construction program, Slocum is doing enormous good through his hobby of reading. At his own expense he will frequently buy many copies of magazines with important articles, and distribute them among his friends. He is conversant with more significant printed matter than most up-to-date editors and literary agents. When Warner & Swasey started its well known advertising campaign on Americanism in national magazines, Slocum was prompt to express his appreciation and approval.

Desires He Still Has

With his enormous record of accomplishment and his present inner serenity, it was only natural to wonder if there were any desires he might have that were still not fulfilled. It turned out that there were.

"I'd like above everything else to see a return, in all of us, especially our young people, to the old concepts of personal responsibility. I'd like to see the emphasis shifted away from 'security' to accomplishment and personal production."

I said, "That's not what I meant, Harvey. Don't you have any desires regarding dams?"

He grinned a little in that boyish way of his and said, "Well, yes. I guess so. If they build just one more really tough one in my lifetime, that's the one I want."

I believe he was dead serious.

Booklet on the Economy Of Timber-Truss Connectors

The origin, development, and acceptance of wood-frame Teco-trussed rafters for roof construction are fully set forth in a new booklet issued by the Timber Engineering Co., 1319 Eighteenth St., N. W., Washington 6, D. C.

This brochure, entitled "Wood-Frame Teco-Trussed Rafters", is intended to be of interest and value to architects, engineers, and contractors. The clear-span trussed rafters, originally designed for residential buildings, are equally adaptable to small industrial and commercial buildings, churches, schools, apartments, factory buildings, warehouses, recreation buildings, and other indoor assembly places, the catalog explains. This whole concept is set forth in text, pictures, and diagrams. There are also detailed descriptions of the latest approved methods of applying Teco wedge-fitted split-ring connectors and Trip-L-Grip framing anchors.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 436.

A Blasting-Cap Plant Scores a Safety Record

During the past five years, 650 men and women of Atlas Powder Co.'s blasting-supplies plant have made more than 250,000,000 blasting caps without a single lost-time injury. The last lost-time accident at the plant occurred in December, 1945, when a worker strained his back handling a drum of materials. Since then, the employees have worked some 6,865,000 man-hours with no injury serious enough to require time off from work.

Panhandle Road Builder Dies

Woody Lee Spencer went to work for Bell & Braden construction company at Texarkana in December of 1923, and began supervising road construction and other building all over Texas, in Oklahoma, and New Mexico. In 1932 he came to the Panhandle, where one of his first jobs was on Highway 66 between McLean and Alanreed. In 1948 he supervised construction of the Amarillo water main, and later one for Abilene. A short time ago he completed an excavation job at Stinnett for a Rock Island-Highway 117 underpass. "When the job was tough," says Wallace W. Braden, "we put Woody on it." On December 4, Woody Lee Spencer, Bell & Braden's Superintendent for 27 years, suffered a heart attack and died.

Rolling-Type Tape Measures as You Walk

A compact measuring device that permits you to measure distances as you walk has been developed by Rolatape, Inc., 1415 Fourteenth St., Santa Monica, Calif. The Rolatape Model 200 has a 2-foot-circumference measuring wheel with a fully collapsible handle. This enables it to be carried in an auto glove compartment or briefcase, or to be stored in a desk drawer.

Taping operations may be performed by one man on vertical, horizontal, or curved-line surfaces. A recessed tape on the rim of wheel indicates measurements in fractions of an inch. An automatic counter records the measurement in feet and in cycles of 100 feet. There is an audible click for every 2 feet measured; a bell rings at the 100-foot mark.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 468.

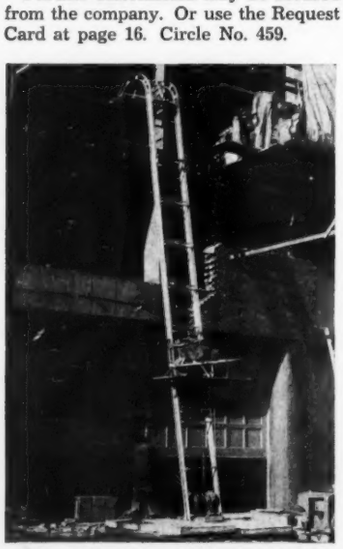
Material Elevator Built Like Ladder

A new development in materials handling has been announced by Campbell Equipment Co., 2122 N. Menard Ave., Chicago 39, Ill. The Lad-E-Vator is a ladder-style elevator that can be used with a 4½-cubic-foot scoop, a wheelbarrow platform, or a flat material deck. It features sectional construction and can be used to heights of 40 feet without support or up to 80 feet with support. The hoist will operate at speeds up to 80 fpm. Track sections are made of tempered aluminum.

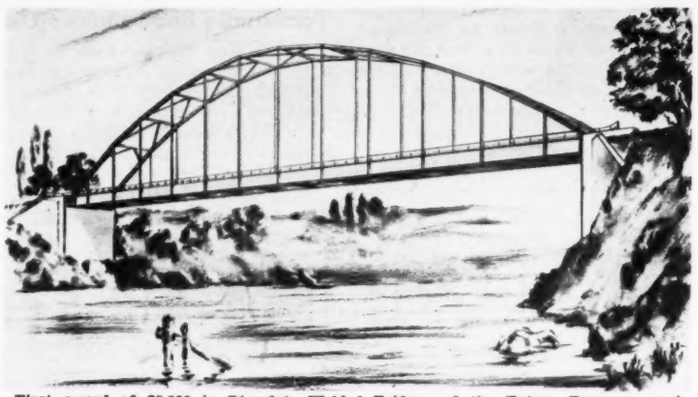
The Lad-E-Vator is operated by one man. It may be equipped with a gasoline engine or an electric motor. Power is connected directly to the winch with a brake on spring tension, so that the load stops automatically when the control lever is released. The operator has full and positive control at all times, the company reports. The aluminum tracks can be extended for exact height, and extension sections are made with slots at one-foot intervals so they can be locked into position.

When this material elevator is used with the scoop, an automatic unloading feature comes into play. As the carriage comes over the curve at the top of the Lad-E-Vator to the dumping position, it engages a spring which slows the carriage yet allows it to bump with sufficient force to clean the scoop of most types of materials. When the carriage is empty, the spring returns it over the curve so that it can fall by gravity—always under the control of the operator.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 459.



This ladder-style material elevator, the Lad-E-Vator, can be used to heights of 40 feet without support. Its hoist operates at 80 fpm.



First award of $5,000 in Lincoln's Welded Bridges of the Future Program went to James H. Jennison, Head of Development Engineering Division, U. S. Naval Ordnance Test Station, Pasadena, Calif., for the design shown above.

Welded-Bridge Awards

The James F. Lincoln Arc Welding Foundation has announced awards of $10,750 in its 1950 Welded Bridges of the Future Program for the design of an all-welded 250-foot highway bridge. James H. Jennison, Head of Development Engineering Division, U. S. Naval Ordnance Test Station, Pasadena, Calif., won the first award of $5,000. Second award of $2,500 went to Ernst Amstutz of Zurich, Switzerland. The third award, $1,250, was given to Thomas C. Kavanagh, Professor of Civil Engineering, Pennsylvania State College, who took the first award in the 1949 bridge competition.

Ten honorable mentions of $200 each went to engineers from South Africa, England, Scotland, and the United States.

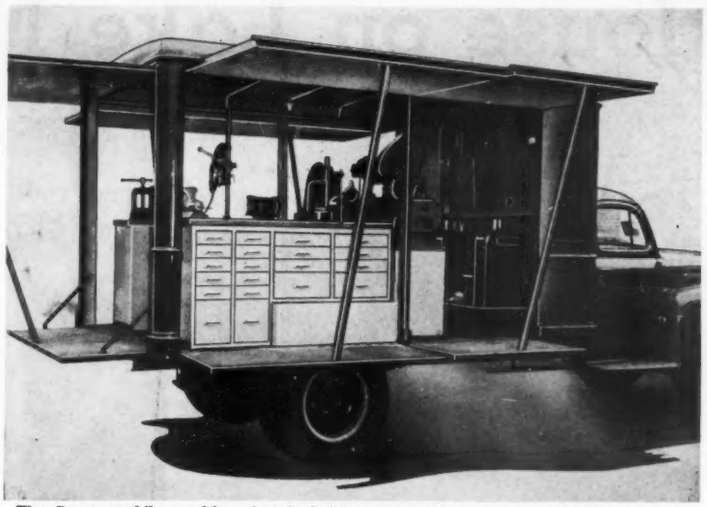
Asphalt Institute Elects

Frank R. Field, of Esso Standard Oil Co., is Chairman of the Executive Committee of the Asphalt Institute for 1951. Bernard E. Gray continues as President. Herbert Spencer was re-elected Secretary of the Institute. George R. Christie and John N. Smith, of Socony-Vacuum Oil Co., were re-elected Treasurer and Assistant Treasurer, respectively.

Mobile Machine Shop

A new truck-mounted machine shop for in-the-field equipment repair has been developed by Cemco Industries, Inc., First National Bank Bldg., Galion, Ohio. The Cemco mobile machine shop has an all-steel welded body with the lower side and rear opening downward to form a platform for working personnel. The top sides and rear open up to form a roof for the operator, and a canvas is attached on the top side to make it waterproof.

The equipment inside the body is installed on three cabinets with hardwood-maple tops. The cabinets have 80 tool drawers and three large compartments. There are over 2,000 tools in the unit, the company says. Electric power to drive the portable drills, grinders, etc. is furnished by a 5-kw generator-welder unit. The welder has a 200-amp capacity. Standard equipment includes a 10-inch bench lathe with all necessary tools, and a complete line of hammers, files, wrenches, clippers, saws, gages, and other small tools. Optional equipment includes a 2-stage air compressor, paint-spraying outfit, 2-ton winch crane, milling machine, and shaper.



The Cemco mobile machine shop is built for mounting on a conventional truck or 4-wheel trailer. The cabinets in the shop have 80 tool drawers and three large compartments. There are over 2,000 tools in the unit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 441.

New Fastening Tool

Dual action, offering a choice of either turn or tap operation, has been incorporated in the Ramset fastening tool, announces Ramset Fasteners, Inc., 12117 Berea Road, Cleveland 11, Ohio. The turn operation is designed for general working conditions, and the tap operation has been retained for application in confined locations. The use of tap operation shortens the tool by nearly 3 inches, the company says.

Other improvements in the light-duty Ramset model are designed to increase safety and ease of operation. A control device makes it impossible to operate the tool with an angle greater than 15 degrees between the outer edge of the shield and the work surface, the manufacturer says. The new larger shields are said to cover 75 per cent more area. With the new tool either a shield or a fixture must be attached to permit operation. Other safety features include precision detonation of powder loads by a single-point firing pin, a telescoping barrel which has to be depressed to make the tool operate, and a combination of controls which require instruction to operate.

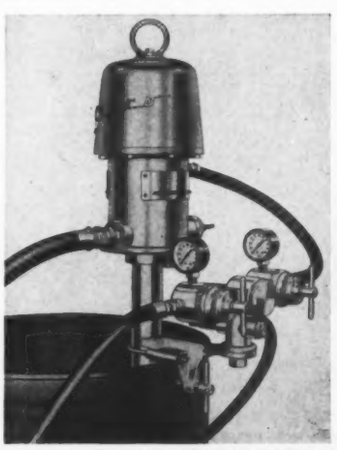
Further information may be secured from the company. Or use the Request Card at page 16. Circle No 423.

New Spray-Gun Pump

Spray-gun spurting, which often projects a blob of heavy material upon a coated surface, is eliminated by the new Graco Mogul-Type Powerflo pump, according to recent announcement by the manufacturer, Gray Co., Inc., Graco Square, Minneapolis 13, Minn. This air-operated material-handling pump is equipped with a device called the Evenflo, designed to prevent spurting.

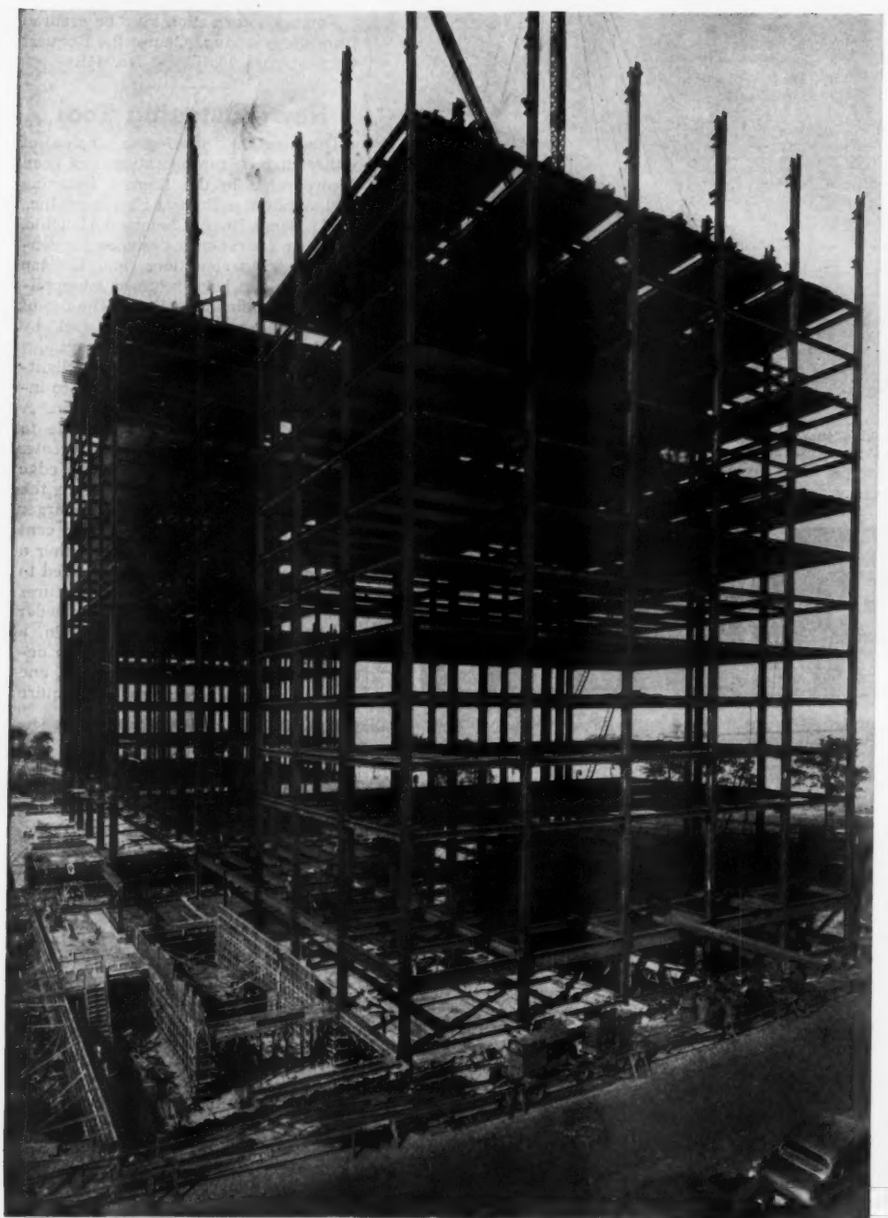
Mogul pumps—operating in original 100 and 400-pound drums or in bucket-type containers—supply rust and corrosion preventives, calking compounds, adhesives, sound deadeners, roofing materials, undercoaters, and other industrial materials through hose for spray-gun, pole-gun, or extrusion-gun application. They operate within an air-pressure range of 20 to 175 psi, and weigh 35 pounds. The power head is cast aluminum. The air motor incorporates steel forgings and machined castings for durability, and large poppet valves for greater efficiency. Easily changed O-rings stop blow-by to provide leakproof seals in the air motor. The piston has balanced double action.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 433.



A new device on the Graco Mogul-Type Powerflo prevents spray-gun spurting.

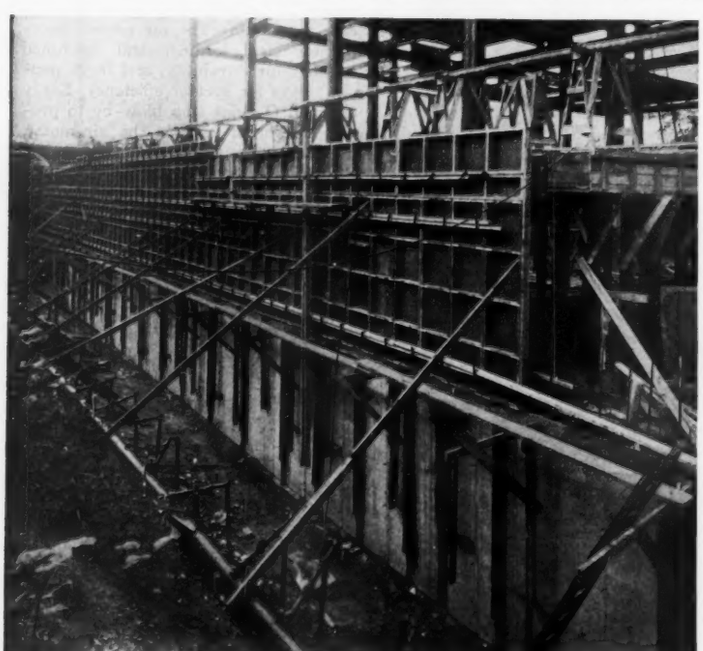
Glass House on Lake Michigan



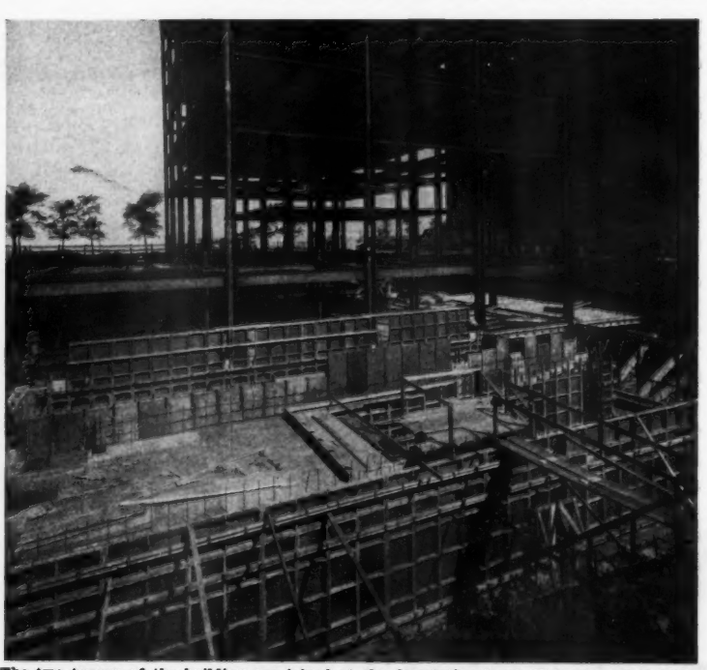
Chicago's new apartment building, 860 Lake Shore Drive, will be ready next July. The substructure is reinforced concrete. The unique steel design of the superstructure will permit floor-to-ceiling windows on all 26 stories making a glass house on the edge of Lake Michigan.

Symons panel forms, hardware, and Safety shores were used throughout the substructure. Here are some shores in place.

This view along the rear wall of the building shows forms with Symons clamps, and Symons shores in the background. More-trench wellpoints dewatered the site; the header pipe is at left.



Walls were poured in 2 or 3 lifts monolithically with some basement and first-floor slabs. Here Symons shores support the second and third pours on the west or rear wall.



The two towers of the building are joined at the foundation level. This view shows the extent of the substructure, which covers some 30,000 square feet out to the curb line.

For Chicagoans

Unique Steel Framing Holds Floor-to-Ceiling Windows in New 26-Story Apartment Along Chicago's Lake Front

By WILLIAM H. QUIRK,
Eastern Editor

• OF the many new construction features embodied in 860 Lake Shore Drive, Chicago's latest skyscraper apartment building, the most noticeable by far are the sweeping glass sides formed by floor-to-ceiling windows on all 26 stories. Unique steel design and construction made possible the framing that holds the glass walls in place. This modern brickless building rests on a timber-pile foundation with reinforced-concrete walls and slabs in basement and sub-basement. Being built at a cost of $4,600,000, the apartment house will be ready for occupancy in July, 1951, 18 months after ground was broken at the site. General contractor is B. W. Handler Construction Co. of Chicago, Ill., which did the substructure and superstructure concrete work itself.

The site for 860 Lake Shore Drive, as the co-op structure is called, is one of the best to be found in any American city. It measures 242 feet along Lake Shore Drive or the east side; 103 feet fronting East Delaware Place to the north; 207 feet on Chestnut Street to the south; and 219 feet along the west side or back of the lot. With a view overlooking Lake Michigan on Chicago's swanky north side, the site also has the advantage of being within a short drive of the Loop, the downtown business and commercial section.

Built to accommodate 3½ to 6-room apartments, the building consists of two units or towers joined at the foundation and ground level, but 48 feet apart above the first floor. Each of the dual towers measures 106 feet 10 inches x 64 feet 10 inches, or nearly 7,000 square feet of floor space on each story. These dimensions are divided into five bays one way, by three bays the other. Building 1, the north tower, has five bays fronting the lake, while building 2, the south tower, is at right angles, with a three-bay side along the lake front. There is a total of 288 apartments in both towers.

Dewatering Problem

Below the level of the ground the structure is much bigger than the two towers, covering nearly 30,000 square feet as it extends out under the sidewalks to the curb line. Here in the basement and sub-basement are accommodations to garage 100 cars. This non-building area is backfilled with a 2-foot layer of dirt providing open terraces surrounding the main ground floor. But this underground construction involved 30,000 cubic yards of excavation that in places went down 35 feet below ground level; the average depth of cut was 22 feet. The hole was dug with a dragline, and trucks hauled away the material that was not required for use as backfill.

Like most of Chicago's lake front, the site for the apartment is on made land that had been filled in some years ago. The subsurface is primarily silt, sand, and clay, with ground water encountered only 10 feet below the surface, an understandable condition with Lake Michigan only about 100 feet across the Drive. When the dragline struck water,

(*Continued on next page*)

C. & E. M. Photo
The steel design, consisting of vertical mullions and horizontal fascial plates welded across the spandrel beams, is both structural and decorative, permitting the use of floor-to-ceiling windows that will give the building its sweeping glass sides.

A Glass Skyscraper On Lake Michigan

(*Continued from preceding page*)

a Moretrench wellpoint system was installed with a 6-inch header line encircling the excavation at water level. The header pipe was set back about 15 feet from the building line which has a perimeter of approximately 800 feet. A total of 180 risers, 20 and 22 feet deep, were installed on average 5-foot centers.

During the setting of the risers they were wrapped in a length of chain to open up a hole in the silt, sand, and clay. When the chain was pulled off, the holes were backfilled with hard torpedo sand to keep the silt and impervious clays away from the wellpoint screens, thus enabling them to function at their best. The hydrostatic pressure was calculated to be 750 pounds per square foot, but the hole was dewatered with an 8-inch pump on the header line, and kept that way with a 6-inch pump that replaced the 8-incher. Foundation work in the big hole, even to the deepest pits, then proceeded "in the dry".

Timber-Pile Foundation

As the site was dewatered, the dragline completed the excavation, while the sides along the streets were kept from caving in by a line of M116 steel sheet piling averaging 35 feet in length. They were braced from the inside with two horizontal lines of double 8 x 14 wales, the upper ring being 10 feet below street grade, and the other ring 5 feet below that. Heavy 10 x 10 drums on 7-foot centers shored up the sheeting.

Timber foundation piles, 1,120 in number, were then driven in clusters of from 4 to 40. Piles have 7-inch tips, 13-inch butts, and averaged 65 to 70 feet in length. Driving was done by the Lake States Engineering Co. of Chicago, using one crawler crane rig equipped with steel leads and a Vulcan 50-C differential-acting hammer. The piles were driven to a bearing averaging 45 to 50 tons, usually with 50 blows to the last foot. Piles were cut off to grade with a Homelite one-man chain saw so that they projected 1 foot into the pile cap footings.

The caps varied in size according to the imposed loads; at one place in the foundation a heavy grillage was installed to straddle an old water intake tunnel from the lake that ran between two of the caps. In some locations the caps went to a depth of 12 feet below the sub-basement floor slab which is at minus 7.6 elevation when the ground level is considered 0.0. Elevation of the basement is at plus 2.4, and the first floor elevation is 13.9. With its 26 stories and penthouse the building height is 306.5 feet.

Reinforced-Concrete Substructure

The sub-basement floor slab is 12 inches thick and the side walls are up to 16 inches thick. Above that is a 6 to 8-inch basement floor slab with 8-inch side walls; all the substructure is of reinforced concrete. The 550 tons of reinforcing in the building was furnished by the United States Steel Supply Co. of Chicago. These foundation walls, 20 and 24 feet high, have approximately 35,000 square feet of surface. Symons panel forms were used throughout, fabricated at the job site in 2 x 6-foot and 2 x 8-foot sections, made up of ¾-inch plywood with 2 x 4 frames. Symons panel form hardware was employed in fitting them together in both vertical and horizontal combinations. Nailing was practically eliminated since wedge bolts held the forms together and also secured the ties. Waling was simple and light, with double 2 x 4 wales on 6-foot vertical centers.

Forms with the erection hardware cost 68.7 cents per square foot. On this job they were used an average of four times, and were still in good condition for future work. It is estimated that as much as 50 per cent more labor would have been required to erect and wreck builtup forms, than was required to erect and strip the panel forms.

Walls were poured in two or three lifts monolithically with sections of the basement and first-floor slabs. Outside forms for the second lift were placed on 4 x 6's, flush with the top of the concrete. The 4 x 6's were supported by Symons Safety shores, and were held to the wall by double 2 x 4's secured by form ties from the previous pour. The Safety shores were also used in the construction of beams, and to support the basement floor slabs.

Under a 21-foot beam spanning a bay, six shores were used. In supporting the basement floor slab the shores were set up on sills placed on the sub-basement floor in rows—3-foot 6-inch centers one way, and 5-foot 3-inch centers the other. Across their tops went 4 x 6 girts on which were laid 2 x 6 joists on 24-inch centers for supporting the ¾-inch plywood deck. Formwork was similar for the first-floor slab construction. Concrete columns in the substructure foundation were built with wooden forms, automatically squared and securely held by Symons Ever Square column clamps.

Concrete Setup

Approximately 11,000 cubic yards of concrete were required for the footing caps, foundation portions, and floor slabs in the skyscraper apartment. Dry batches were delivered to the job site by Materials Service, Inc., of Chicago, where they were mixed into concrete in a Ransome 28-S mixer set up at ground level. From the mixer drum the concrete was discharged by gravity down a chute to a Rex 160-S Pumpcrete equipped with a single 6⅝-inch pump. All the concrete, up to and including the first-floor slab totaling some 5,300 yards, was handled by Pumpcrete through a 6-inch line emptying directly into the forms. As the concrete was placed, it was vibrated with Master vibrators.

Anti-hydro, a waterproofing admixture, was added to the substructure concrete at the rate of 1½ gallons to

(*Continued on next page*)

the yard of concrete. For placing concrete above the first-floor level, the handling was done in the conventional manner via bucket, tower hoist, and buggy.

Steel Erection

The 2,842 tons of structural and the 856 tons of plate steel for the face of the building were furnished and erected by the American Bridge Co. of Gary, Ind., the material being delivered to the job by truck. Erection started June 1 and was completed in November, 1950. Base plates for the columns in the footing caps range in size up to 9 inches thick and 3½ feet square; anchor bolts are 2¼ inches x 3 feet long. Columns for the 21-foot-square bays are 14 inches throughout, but vary in weight from 342 pounds to the foot in the subbasement to 43-pound sections at the top of the structure.

Two guy derricks, one for each tower, did the erecting. Each rig had a 75-foot boom and an 82-foot mast, together with a Clyde two-drum hoist powered by a General Motors diesel engine. A Manitowoc Speedcrane with a 75-foot boom and a 20-foot jib was on hand for auxiliary steel erecting. The guy derricks picked the steel off the delivery trucks and erected it, jumping up in two-story moves as the towers rose in the air. The members were first bolted, then riveted with ⅞ or 1¼-inch rivets. Rivets in the structure totaled 135,000 approximately, with six crews doing the work. Boyer riveting hammers were used, with the air supplied by a Chicago-Pneumatic 315-cfm compressor.

The unique-looking steel face of the building consists of horizontal fascial plates welded across the spandrel beams, with vertical I-beam mullions on 5-foot 3-inch spacing running the height of the building. The fascial plates are 5/16 inch thick, 20 feet wide out to out, and average 1 foot 7½ inches in depth. The mullions are 8-inch 20-pound I-beams extending from floor to ceiling between each story.

Structural and Decorative

This type of steel facing is both structural and decorative in function, being part of the steel and glass sides of the building, and permitting the use of floor-to-ceiling windows. The Sealuxe aluminum window frames with ¼-inch plate glass are supported by the steel framing. The fascial plates around the spandrels also serve as side forms for the floor-slab pours, while the mullions act as stiffeners and give the exterior a distinctive appearance. This unique steel and glass exterior, used for the first time in an apartment building, it is said, is being completed at a cost per square foot of $3.55. Such a unit-cost figure for highest-quality construction compares quite favorably with conventional construction.

The structural members for the facing came knocked down to the job, and were hoisted to one of the upper stories where a temporary wooden floor had been laid out supported by the steel frame of the building. Here were the jigs and the templates for assembling the fascial plate and mullion facing. They were welded together in sections covering two stories in height and one bay (21 feet) in width. Then they were lowered by the derrick to the proper level, clipped in position, and welded to the spandrel beams. Vertical mullions are also welded to the steel columns. Welding on the job was done with seven Lincoln welding machines.

Above the first story, Cofar floors are used throughout. Cofar is a 24-gage corrugated galvanized metal that came in sheets 10 feet 5 inches long x 26 inches wide, allowing for a lap with the adjoining sheets. Their length permitted the use of two sections to a bay. This is the first sizable installation of this material since its development. This flooring was laid by the American Bridge Co., and the sheets were welded to the floor beams. Concrete was then laid on top of the Cofar, forming a slab with a total depth of 3½ inches measured to the bottom of the corrugation. Running transverse to the corrugations at the bottom of the metal are ¼-inch T-wires on 6-inch centers. Over the beams at mid-depth in the slabs is negative reinforcing consisting of ½-inch rods, 5 feet long, on 8-inch centers. Concrete with a strength of 2,500 psi at 28 days is being used in the slabs.

No shoring was used in placing the Cofar, the sheets being supported on 4 x 6 or 4 x 8 uprights resting on the bottom flanges of the floor beams. Hung ceilings are supported from the bottom of the floor slabs. Only the four interior columns adjacent to the elevator and stairs are fireproofed with concrete. The balance of the interior columns are fireproofed with metal lath and plaster, using thicknesses recently developed, and tested and approved, by the Underwriters Laboratories for 4-hour rating. Exterior columns are fireproofed with concrete on the exterior face between the outer flange of the column and the steel skin, which acts as a permanent form for the fireproofing material. The rest of the typical exterior column on the interior side is fireproofed with metal lath and plaster. Floor beams are likewise fireproofed with plaster. Lightweight vermiculite plaster was used. Vermiculite was also employed in the brown and finish plaster coats on the walls and ceilings.

For the roof the Cofar was covered with a 2-inch insulation course followed by a tar and gravel topping. Tenants are given a choice in floor surfacing.

The apartment house is heated by Fitzgibbons boilers which are located in the south tower. The heating system is split in two parts with thin coil-type radiation located between ceiling and the floor slab. These coils have hot water circulating constantly without control, except for inside-outside temperature control acting on a 3-way mixing valve to govern the temperature of the water leaving the boiler room. These coils will furnish approximately 60 per cent of the total heating required by radiation from the ceiling and the floor. The balance of the heat-

(Concluded on next page)

A Glass Skyscraper On Lake Michigan

(*Continued from preceding page*)

ing requirement is supplied by means of thin coil conductor-type radiation enclosed in the base of the aluminum sash. These coils are controlled by individual Minneapolis-Honeywell thermostats; thus 40 per cent of the heat requirement is under control by zone thermostat, and 60 per cent furnished at the constant rate.

Personnel

Pace Associates and Ludwig Mies Van Der Rohe were the architects and engineers on the design of 860 Lake Shore Drive. Both have offices in Chicago. Associate Charles B. Genther handled all phases of coordination, preliminary drawings, working drawings, and engineering design; acted as contract officer in seeking bids; and assisted the owner in awarding the contracts. William Cobb, Architect, was in charge of production of architectural drawings. K. D. Farwell was the architect's representative on the job, assisted by Earl R. Fenske.

Thomas W. Doane, Vice President of B. W. Handler Construction Co., the general contractor, served as Project Manager on the construction which was carried out by an average force of 150 men. Joe Prang was Superintendent for Handler, and G. W. "Tex" Twinning was Superintendent for the American Bridge Co. on its part of the work.

New Lighting System Portable for Job Use

A new low-voltage portable lighting system for construction and mining work, the Joy-Lite, has been announced by the Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa. Driven by compressed air, the Joy-Lite will develop an output of 250 to 280 watts (power to operate four high-powered sealed-beam flood or spotlights) with air consumption not exceeding 25 cfm, Joy says. For protection from dirt and dripping water, the generator is mounted in a steel box with a carrying handle. The lamps have tripod swivel bases which can be used as column clamps, and hooks which serve as hangers. The unit weighs 48 pounds.

Further information may be secured from the company by requesting Bulletin 87-I. Or use the Request Card at page 16. Circle No. 427.

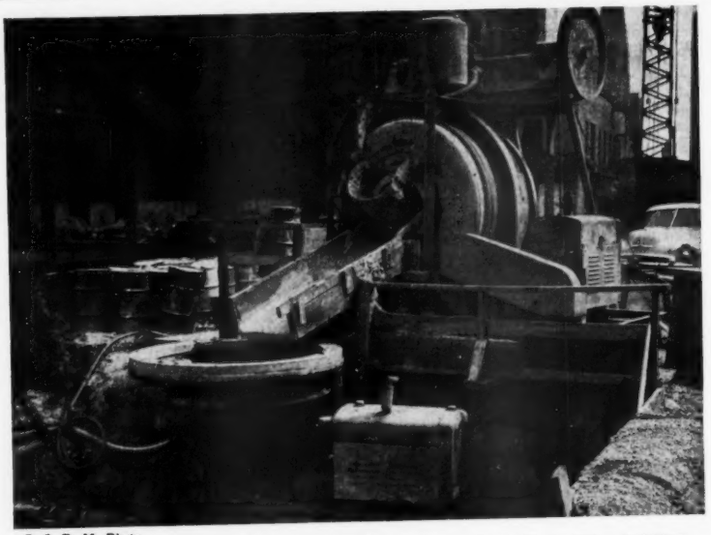
Aids for the Field Man

A series of circulars describing pocket-sized instruments for use by men in the field has been prepared by the Stratex Instrument Co., 1861 Hillhurst Ave., Los Angeles 27, Calif. These field aids include a hand level, the Wasatch Layout Pentaprism, a pocket stereoscope, and a 6-power telescope called the Penscope.

The Stratex hand level features quick outside adjustment to eliminate "halving" of errors and peg adjustment. The Pentaprism is designed to reduce the number of transit setups required when using angles that are multiples of 90 degrees; it is said to enable rapid and accurate takeoffs 90 or 270 degrees from a line. The pocket stereo permits instant interpretation, in the field, of aerial photographs for use in density studies, route planning, flood control, etc. The Penscope slips into the pocket like a fountain pen and provides quick-focus 6-power magnifications, the literature says; one application suggested is for rodsmen determining the transitman's signals at great distances.

The circulars describe each instrument and give specifications and prices.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 472.



C. & E. M. Photo
A Ransome 28-S mixer and a Rex Pumpcrete at the 860 Lake Shore Drive building.

Tapping Concrete Pipe

"'Tain't the initial cost, it's the upkeep", said the marriage-license clerk as he took the two dollars. That's one of the reasons why maintenance must be considered in the purchase of pipe, and one of the things about maintenance to consider is the ability to tap the pipe, says a new catalog prepared by Price Bros. Co., 1932 E. Monument Ave., Dayton 1, Ohio. The literature then goes on to outline a method of tapping prestressed-concrete pressure pipe.

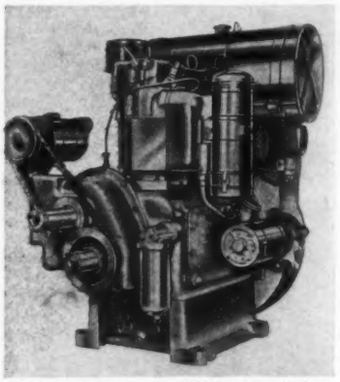
The folder illustrates the way this is done and points out that the pipe is stronger at the tap than it was before. Photographs with descriptive captions illustrated how small and large-diameter connections are made. All fixtures and equipment for this operation are available from the company for any of its pipe sizes.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 474.

Air-Cooled Diesels Deliver 8 and 20 Hp

It has recently been announced that the Armstrong-Siddeley single-cylinder and two-cylinder air-cooled diesel engines will be marketed and serviced in this country by Lister-Blackstone, Inc., 420 Lexington Ave., New York 17, N. Y., under a national distributor set-up. The single-cylinder model develops 8 hp at 1,500 rpm; the two-cylinder model delivers 20 hp at 1,800 rpm and is said to be the highest-powered air-cooled diesel available in the U. S. Both models have a 4¼ x 4¼-inch bore and stroke.

These engines are designed for quick hand starting under low-temperature conditions, but may also be fitted with standard electric Auto-Lite starters and generators. According to the manufacturer, the engines may be used as power sources for crushers, compressors, concrete mixers, saws, pumps, etc. Both models can be furnished with standard SAE bell housing mounted on the flywheel cowl to accept standard generator housings for developing 3 to 10-kw electric service.



The new Armstrong-Siddeley 2-cylinder diesel delivers 20 hp at 1,800 rpm. It is said to be the highest-powered air-cooled diesel available in the U. S.

Further information may be obtained from the company. Or use the Request Card at page 16. Circle No. 460.

Blacktop Heater-Planer

An illustrated circular on the Clark-moore asphalt heater-planer for maintenance work on blacktop roads has been prepared by the Asphalt Maintenance Co., 41 Park Row, New York 7, N. Y. The unit is a self-contained mobile assembly consisting principally of a fuel-oil burner and heating hood, and a 2-section blade. The burner throws a flat horizontal flame into the heating hood, thereby enabling the smooth planing action of the 2-section blade which cuts and removes corrugated-asphalt pavements to any desired depth. The depth of cut is controlled hydraulically. Full specifications on the burner, blade assembly, frame, and other component parts are provided.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 426.

Lightness, compactness, balance, and accuracy feature Skilsaw's four redesigned electric drills, ranging from ½ to 1½ inches in capacity.

New Electric Drills With Large Capacity

Four redesigned electric drills have been introduced by Skilsaw, Inc., 5033 Elston Ave., Chicago 30, Ill., manufacturer of Skil portable tools. The new drills (Models 283, 2101, 2103, 2121) range in capacity from ½ to ¾ inch for work in steel, and up to 1½ inches for hardwood. Features claimed are lightness, compactness, balance, and accuracy. Ease of control and vibration-free performance eliminate fatigue, the company says.

The ½ and ⅝-inch models are high-speed drills, weighing 14½ pounds and measuring 16⅛ inches in length. High-torque low-speed models are available in ⅝ and ¾-inch capacities. Speeds run as low as 250 and as high as 1,000 rpm. All models have die-cast aluminum-alloy housings, over-size ball bearings, needle bearings, helical gears, and geared chucks. Morse taper pockets are available in place of the geared chucks at no extra cost.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 489.

Bin and Feeder Bulletin

An 8-page bulletin on feeders and bins for both portable and stationary rock and gravel plants has been announced by Diamond Iron Works, Inc., 18th Ave. and N. Second St., Minneapolis, Minn. It features the variety of feeders, both apron and plate types, that are available from the company, and includes complete information on sizes, construction, and power drives. Two-color diagrams illustrate the material flow line. Complete information is also given on the Diamond steel bins and hoppers, which range in capacity up to 110 cubic yards.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 425.

Represent Hose Accessories

Arthur W. Gadd is now factory representative for Hose Accessories Co. in Missouri, Kansas, southern Illinois, western Iowa, and Nebraska. His headquarters are at 1805 Grand Ave., Kansas City, Mo. Almon O. Snyder serves the manufacturer of the Le-Hi line in the same capacity in Ohio, Pennsylvania, West Virginia, Kentucky, and southern Indiana. His headquarters are at 8001 Carnegie Ave., Cleveland.

Price M. Davis, Jr., 5807 N. Crestwood Blvd., Milwaukee, has been given more territory as a Hose Accessories factory representative. He will continue to cover Minnesota, Wisconsin, northern Illinois, and northern Indiana. In addition to this territory, he will cover Michigan.

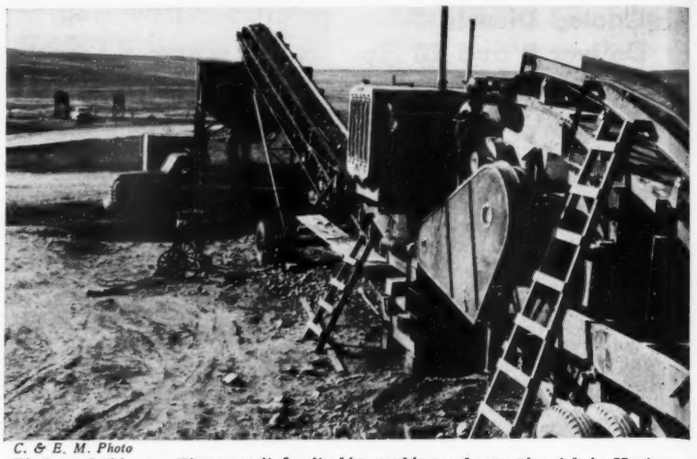
Montana Pushes Road Through Wilderness

Contractor Screens Rock for Subbase on 18-Mile Wilderness Highway in Rocky Mountains

• CONSTRUCTION of a rock base over 18 miles of wilderness highway in Montana is a big crushing and screening assignment in anybody's language. About 142,214 tons are involved. S. Birch & Sons of Great Falls has the contract on State Route 20, between Simms and Rogers Pass over the Rocky Mountains near Lincoln.

Birch & Sons completed 4.82 miles of new grade on this road before the last war, and at a cost of $232,851 has just completed another 8.46 miles of new grade linking Great Falls with Lincoln, Mont. It finished regrading and laying back the slopes on the old job for 3.50 miles in a new contract which also calls for graveling and oiling 18 miles of the same road at a cost of $245,036.87, to be completed this year.

The subbase consists of a 7-inch compacted thickness of 4-inch-minus selected pit-run gravel, topped by 3 inches of ¾-inch crushed material which will have a penetration oil surface. The base course is 32.6 feet wide, while the surface course will be standard 24-foot pavement.



C. & E. M. Photo
Birch used this new Pioneer unit for its big crushing and screening job in Montana.

When the Simms-Rogers Pass section is finished this spring the Great Falls-Missoula cutoff, a saving of approximately 50 miles over the present improved highway, will be 60 per cent complete.

Several Pits Used

Three pits were used. The first was 3.5 miles from the north end of the project, and the other two were along the job. Economic construction practice dictated that the haul be held to 7 miles, so the north pit furnished somewhat less material than the other two.

The sizing unit for the pit-run gravel was a new Pioneer 1950 unit. A Caterpillar D8 with a LeTourneau FP Carryall brought the pit-run material up to a feeder hopper which was fed by a D8-mounted dozer.

The trap funneled down to a 30-inch Pioneer feeder, which moved the material onto a delivery conveyor. The conveyor took the gravel to a scalping screen deck, where the oversize stones were removed. They passed to a 24 x 36 jaw crusher, and then back to rejoin the throughs.

Sized material then passed to a 20-ton surge bin, where a fleet of 28 rented dump trucks of various makes were ready to load. The loads were weighed out on a set of Winslow beam scales.

The power plant for the new Pioneer unit was a Caterpillar D13000 diesel engine. Long drive rods reached up to the head sheaves and drove the conveyors. The plant has many route adjustments possible, and consistently

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sized about 280 tons an hour.

Processing

The material was dumped along the highway in a windrow sufficient to make the 7-inch lift. Traffic was blocked off while the work was in progress. When a section about a mile long had been dumped, Caterpillar No. 12 blades road-mixed the material, while water was added. The gravel did not require too much water.

After the material was uniformly mixed, the motor graders then cut the windrow several ways and laid the material in gradually. The base was rolled by steel-wheeled 10-ton rollers. The subbase was expected to be finished in 1950, and the road opened to automobile traffic during the late fall and winter. This spring the 3-inch compacted depth of top-course material will be crushed and laid.

The finished road will be a high-type bituminous highway on Montana's 7 per cent System.

Field contract work is under the supervision of C. M. Loser, General Superintendent. Al Miller is the Crusher Foreman, Bert Kessler is Master Mechanic, and John Haven is Office Manager.

Detachable Drill Bit

The Liddicoat detachable drill bit is a one-use throwaway rock bit made from specially selected forged and heat-treated steel. Its outstanding feature is a pilot which chips the rock ahead of the cross-wings to eliminate pulverizing action. Second feature is the ease with which it may be attached to or detached from the drill steel. This bit is manufactured and distributed in the 37 eastern states by Calumet & Hecla Consolidated Copper Co., Calumet, Mich., and in the 11 western states, the Philippines, and Alaska by Western Rock Bit Mfg. Co., 552 W. 7th S., Salt Lake City, Utah.

The Liddicoat Type L bit is made for use with all conventional steel sections. Gage sizes are varied enough to assure selection of bits suitable for any rock conditions, the company says. Special knock-off blocks are stocked or can be made up for use with any type of drill steel. This bit, the company says, is adaptable for practically all mining and rock-drilling applications.

The Liddicoat bit features two-stage cutting action—the pilot cut and the wing cut. The company points out that collaring of holes is made easier by the pilot, which immediately bites into the rock on application. The slip-on method of attachment provides quick connection and positive rotation. It also makes possible the use of a short, strong bit connection. The short skirt is said to permit free discharge of coarse cuttings and the use of smaller gage sizes.

Further information may be secured from either of the companies. Or use the Request Card at page 16. Circle No. 529.

First-Aid Equipment

A 4-page folder on first-aid equipment has been prepared by The Pac-Kit Co., P. O. Box 1306, Greenwich, Conn. It provides information on the quantities and types of supplies contained in each kit offered by the company. In addition to supplying standard accident kits, the company also makes a first-aid snake-bite kit.

The literature points out that the Pac-Kit is contained in an electrically welded 20-gage heavy-duty steel case with rubber gaskets to protect the contents from dust and moisture. The cases have folding metal hangers to facilitate installation as wall kits or for mounting in motor vehicles. Price lists of kits and refills are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 452.

Hydraulic Coupling, Pressed-On Design

A new hydraulic hose coupling which features pressed-on design and is made for hose from 3/16 to 2-inch ID has been announced by the Mulconroy Co., 5339 Jefferson St., Philadelphia 31, Pa. With the Press Lock design, the entire wall of the hose is confined within the full length of the coupling. The cover is not cut away to accommodate any part of the coupling. This feature, the company says, extends the life of the hose and coupling.

The company points out that by displacement of the rubber hose under pressure, a 3-way locking arrangement is obtained. It is effected by a gripping of the inner part of the rubber mass to corrugations on the stem, anchoring of the outer portion in sleeve apertures, and multiple protrusions of internal wire braid. This, coupled with the engagement of the forward end of the sleeve over the collar back of the hexagonal portion, provides a grip said to be proof against blowoffs.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 406.

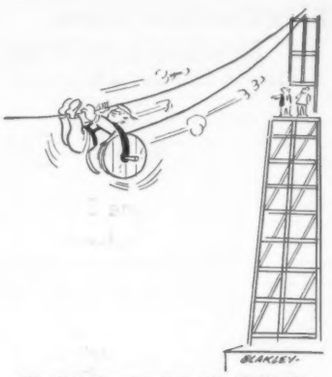
Data on New Fifth Wheel

A circular describing the new 2000 Series fifth wheel has been offered by Austin Trailer Equipment Co., Muskegon, Mich. This series is available in the rubber-cushioned rocking type, the nonrubber-cushioned rocking type, and the nonrocking rigid dolly type. Brackets come in two heights, with holes located for U-bolting to 34 or 36-inch frames. The circular outlines all construction and safety features.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 540.

Robinson Names W. C. Slee

William C. Slee has been promoted to Chief Engineer of the Sales Division of The Robinson Clay Product Co., Akron, Ohio. He will work with and through the firm's district offices in 19 states and in two Canadian provinces. Before joining Robinson in 1942 Slee served as Assistant Engineer Director of the American Road Builders' Association.

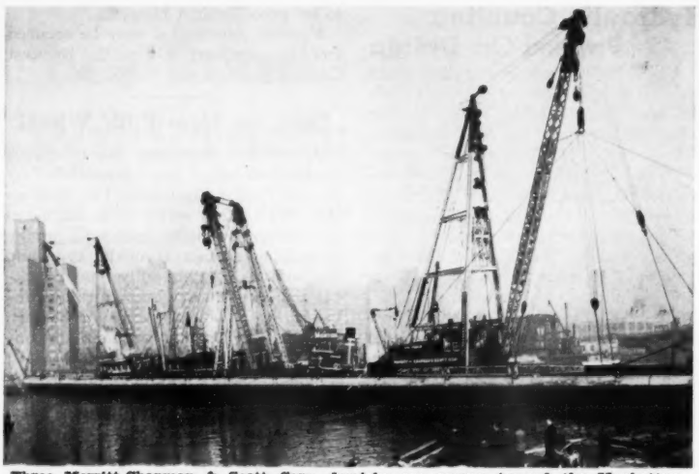


"Is that the one you call 'Spider'?"

Three Derricks Lower Pipeline Into River

The Merritt-Chapman & Scott Corp. of New York City harnessed three floating derricks in a single-file formation to lower a 568-foot-long 173-ton rigid section of pipeline to the bottom of the Harlem River in New York. The pipe crossing links the Transcontinental Gas Pipe Line Corp. terminal point at Hudson River and 135th Street to the various stations of utility companies serving Manhattan, the Bronx, Brooklyn, Queens, and Nassau.

The pipeline had to be lifted from its assembly position on the Bronx side of the Harlem River, and, while maintained in precise alignment, swung broadside across the river and maneuvered into position above a previously prepared trench in the river bottom. Then, still in alignment, it had to be lowered into place. The trench, which was dredged and in some places cut through rock, was 20 feet wide, with its bottom approximately 35 feet below water surface. The steel piping, made of ½-inch steel, measured 30 inches in diameter, and was encased in a 3½-inch jacket of reinforced concrete.



Three Merritt-Chapman & Scott Corp. derricks are swung toward the Manhattan side of the Harlem River. Cables rigged to the New York Central Railroad Bridge pull the rear derrick down stream until the pipe held by the derricks spans the entire 490-foot breadth of the river. Note how the pipe riser (at the Manhattan end) is about to fit into the slit trench prepared to receive it.

In preparation for the job the three Merritt-Chapman & Scott derricks—the 125 x 45-foot California having a 90-ton lifting capacity, the 154 x 50-foot Monarch with a 250-ton lifting capacity, and the 135 x 50-foot Colossus with 90-ton lifting capacity—were harnessed together with 2-foot spreaders between the California and the Monarch and 10-foot spreaders between the Monarch and the Colossus. They had a combined hull of 426 feet and a combined lifting capacity of 430 tons.

The timing of the operation was determined by the tides, and at 6:00 a. m. on October 22 the three 100-foot derrick booms with winch-operated cables lifted the pipe from its assembly position far enough into the air to clear the blocking on the dock. A cable tied to 135th Street in Manhattan pulled the derricks out toward the Manhattan shore. Tieback cables from the Colossus held the alignment steady until the Bronx end of the pipe cleared a nearby warehouse. Then a cable tied to the New York Central Railroad Bridge pulled the Colossus end downriver so as to maneuver the 3-derrick single-file formation into position.

To ease the pressure on the pipe, and to assure its being maneuvered with equal strain and stress throughout, strongbacks were used. The strongbacks for the California and Colossus were made from 85-foot derrick booms with 60-foot structural-steel trusses to handle pipe risers at either end. The Monarch strongback was a specially fabricated steel frame 150 feet long. One-inch wire-cable straps supported the pipe at 18 points.

When in position the pipeline was lowered one foot at a time into the prepared trench. Divers inspected its position. The central piece, 452 feet 9 inches long, with a 50-foot 5-inch rise on the Manhattan side and a 66½-foot rise on the Bronx side, was found to be firmly resting on the gravel base. The divers then unbuckled the release slings secured to the pipe, and burned off the end connections with oxy-hydrogen underwater cutting torches. When the strongbacks were pulled away, the river was cleared for normal marine transportation and at 12:00 noon the Circle Line Sightseeing yacht Sightseer passed over the pipe.

Convention Calendar

February 20-22—Concrete Institute
Annual Convention, American Concrete Institute, St. Francis Hotel, San Francisco, Calif. Harvey Whipple, Secretary-Treasurer, 18263 W. McNichols Road, Detroit 19, Mich.

February 20-22—Illinois Highway Conference
Annual Conference on Highway Engineering, University of Illinois, Urbana, Ill. W. S. Pollard, Jr., Highway Conference Committee, University of Illinois, Department of Civil Engineering, Urbana, Ill.

February 26-March 1—AGC Meeting
Annual Convention, Associated General Contractors of America, Statler Hotel, Boston, Mass. H. E. Foreman, Managing Director, Munsey Bldg., Washington 4, D. C.

March 5-9—ASTM Meeting
Spring Meeting and Committee Week, American Society for Testing Materials, Netherland Plaza Hotel, Cincinnati, Ohio. C. L. Warwick, Executive Secretary, 1916 Race St., Philadelphia 3, Pa.

March 5-9—North Atlantic States Meeting
Annual Meeting, Association of Highway Officials of North Atlantic States, Atlantic City, N. J. A. Lee Grover, Secretary, N. J. State Highway Department, Trenton, N. J.

March 6-7—Cornell Turf Conference
Annual Meeting, Cornell Turf Conference, Statler Hall, Cornell University, Ithaca, N. Y. J. F. Cornman, Plant Science Bldg., Cornell University, Ithaca, N. Y.

March 8-10—Mississippi Valley Meeting
Annual Meeting, Mississippi Valley Conference of State Highway Departments, Edgewater Beach Hotel, Chicago, Ill. For information, write direct to hotel.

March 12-14—ARBA Meeting
Annual Meeting, American Roadbuilders' Association, Schroeder Hotel, Milwaukee, Wis. Lt. Gen. Eugene Reybold, Executive Vice President, International Bldg., Washington 4, D. C.

March 26-29—Purdue Road School
Thirty-Seventh Annual Purdue Road School, Purdue University, Lafayette, Ind. Prof. Ben H. Petty, School of Civil Engineering, Purdue University, Lafayette, Ind.

March 28-30—N. Y. Highway Engineers
Annual Convention, New York State Association of Highway Engineers, Rochester, N. Y. William H. Saunders, Convention Secretary, P. O. Box 72, Rochester, N. Y.

April 2-4—Highway Engg. Conference
Annual Meeting, Utah Highway Engineering Conference, Union Bldg., University of Utah, Salt Lake City, Utah. Prof. A. Diefendorf, Head, Department of Civil Engineering, University of Utah, Salt Lake City, Utah.

April 3-6—N. Y. Safety Convention
Annual Safety Convention and Exposition, Greater New York Safety Council, Statler Hotel, New York, N. Y. Paul F. Stricker, Executive Vice President, Greater New York Safety Council, 60 E. 42nd St., New York 17, N. Y.

April 4-7—Roadside Development Course
Tenth Annual Short Course on Roadside Development, Departments of State Bldg., Columbus, Ohio. Prof. Chas. R. Sutton, Landscape Architect, Brown Hall, Ohio State University, Columbus 10, Ohio, or Wilbur J. Garmhausen, Chief Landscape Architect, Department of Highways, Columbus 15, Ohio.

April 4-7—Roadside Development Course
Second Annual Short Course Conference on Roadside Development, Louisiana State University and Louisiana Department of Highways, Old Peabody Hall, Baton Rouge, La. H. A. Mike Flanakin, Associate Prof. of Civil Engg., Louisiana State University, or T. Slack, Roadside Development Engineer, Louisiana Department of Highways, Baton Rouge, La.

April 5-6—Kentucky Highway Conference
Annual Meeting, Kentucky Highway Conference, College of Engineering, University of Kentucky, Lexington, Ky. R. E. Shaver, Head, Department of Civil Engineering, University of Kentucky, Lexington, Ky.

Ladder Shoes for Safety

A circular describing the Safe-Hi ladder shoes, designed to stop ladders from slipping, has been offered by Rose Mfg. Co., 1731 Arapahoe St., Denver 2, Colo. It points out that the cord, rubber, ridged construction, and self-sharpening spikes of the shoes provide safety under all conditions.

All sections of sectional ladders can be equipped with the shoes and then be nested, joined, or used separately without interference or hazard, the circular explains. Regular steel or non-spark models are available in two widths, 1⅜ inches and 5/16 inch.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 443.

Vibrators and Screeds

New literature describing a complete line of gasoline and electric-powered vibrators and screeds has been prepared by Stow Mfg. Co., 57 Shear St., Binghamton, N. Y. This bulletin, No. 507, discusses vibration in concrete work, recommends specific types of gasoline or electric vibrators for specific jobs, and illustrates Stow products.

The Stow vibrating screeds described on the back page of the bulletin, are available in four models with spans of 6, 8, 10, and 12 feet. The complete unit includes a 1½-hp Power Pak with built-in vibrator mounted on heavy brackets which are bolted to the beam. The folder explains that the Power Pak and all essential parts are available as an independent unit for the contractor who wishes to build his own screed.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 482.

Allis-Chalmers Appointments

L. W. Davis is now Manager of the Allis-Chalmers Oakland, Calif., office, succeeding N. B. Nelson, who has retired. G. W. Schierman, formerly Assistant Branch Manager at Pocatello, Idaho, now succeeds Davis as Manager there. Norman B. Nelson, a former blockman at Pocatello, is now Manager of agricultural sales there.

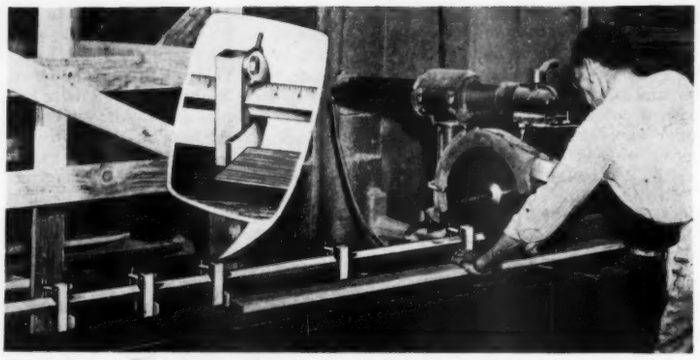
Multiple-Stop Gage For All Power Saws

Designed to put power cutoff sawing on a mass-production basis, a device known as the Comet adjustable stop gage has been introduced by Consolidated Machinery & Supply Co., Ltd., 2031 Santa Fe Ave., Los Angeles 21, Calif.

According to the manufacturer, the gage will materially increase the production output of any power saw. Several predetermined lengths can be set at one time and accurate cutoff made as rapidly as the saw can be pulled through the work, the company says.

All stop blocks have 4 square inches of gripping surface and can be set at any position without using a wrench. Additional stops can be added at any time without disturbing other stops already positioned on the bar. The bar is cold-rolled steel engraved in eighths of an inch for right or left-hand application. Stop blocks are solid steel; the stop trigger is forced against the block (not away) by the work to prevent misalignment and inaccuracy. All parts are plated to prevent rust.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 402.



Production on any power saw can be increased by using the Comet adjustable stop gage, says Consolidated Machinery & Supply Co.

Three Lightweight Pumps

A 4-page folder describing four self-priming centrifugal pumps for small job applications has been announced by The Gorman-Rupp Co., Mansfield, Ohio. These units are a 1½-inch pump with a capacity of 5,500 gph, a new 2-inch pump for 7,500 gph and another 2-inch for 10,000 gph, and a 3-inch pump that delivers 18,000 gph. The capacities indicated are for a suction lift of 10 feet; all three units are designed for a maximum lift of 30 feet.

The catalog describes the design and operating characteristics of the Gorman-Rupp pumps and uses cross-section drawings to illustrate priming and pumping action. Specifications and pumping characteristics are included in the folder.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 421.

Three Arc Welders

A new series of industrial ac arc welders has been brought out by Marquette Mfg. Co., 307 E. Hennepin Ave., Minneapolis 13, Minn. The 80 Series welders are available in three sizes—200, 300, and 400-amp capacities—and are designed for heavy-duty round-the-clock production welding. A key construction feature is the use of Hipersil steel transformer cores, which are said to provide one-third-greater flux-carrying capacity and to reduce power consumption and operating costs.

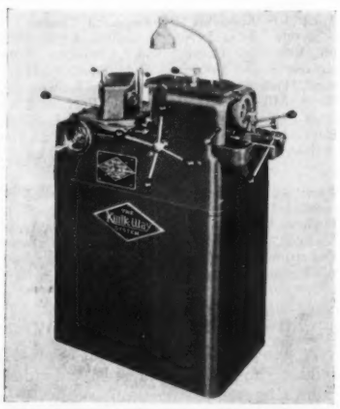
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 522.

Valve-Facing Machine

A new valve-facing machine designated the Kwik-Way Model W Valve Master has been announced by Cedar Rapids Engineering Co., Cedar Rapids, Iowa. It is a precision wet grinder designed for continuous duty on long production runs in refacing automotive engine valves, and for heavy-duty refacing of large valves such as those on diesels. Interchangeable chucks provide a capacity for valve stems from 3/16 to 1¼ inches in diameter. Valve heads to 6½ inches can be accommodated. The standard lever-operated Kwik-Way chuck accommodates valves from ¼ to ⅝ inch and remains open at full capacity until released by the operator. The other range of sizes is covered by hand-operated chucks.

All chuck operations are controlled by a lever which instantly stops chuck rotation regardless of the position of the grinder head. Speed, convenience, and accuracy of angle setting are provided by built-in stops at 15, 30, and 45 degrees, the company says. New features permit grinding of rocker arms and surface or cutoff grinding. The machine has a 6-inch valve-grinding wheel, 5-inch surface-grinding wheel, and separate ½ and ⅛-hp grinder-head and valve-chuck motors. An independent motor-driven coolant pump delivers the coolant to either grinder wheel from a 5-gallon-capacity tank.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 451.



Interchangeable chucks on the Model W Kwik-Way valve-facing machine accommodate valves with stems from 3/16 to 1¼ and heads to 6½ inches.

Local Gravel Used In Hot-Mix Paving

Same Mix for Two Courses on Road and Sidewalk Cuts Costs On Maine Bituminous-Concrete Highway Project

• AFTER having successfully inaugurated in 1949 the use of local gravel aggregate in bituminous-concrete mixes (see C. & E. M., August, 1950, pg. 57), the Maine State Highway Commission this past season continued with more of the same type of pavement. One of the larger such projects given out to contract was a 7.68-mile section on U. S. 202 in York County, extending from Alfred north to the intersection of State Route 5. Except for a short stretch in Waterboro, midway of the job, the alignment is mostly on new location.

The old road had a bituminous-surface-treated gravel pavement 18 feet wide. The new highway has a 24-foot blacktop surface which is widened to 40 feet through the village of Waterboro. This urban portion has 5-foot sidewalks, laid with the same type of mix used in paving the road and to the same 3-inch thickness. Both road and walks are laid in two 1½-inch courses on treated-gravel bases.

Grading on the new location began in December, 1949, after the Highway Commission awarded a contract for the work to Frank Rossi of Gardiner, Maine, on his low bid of $423,125. The earthwork was handled with shovels and trucks, the necessary borrow being obtained from nearby pits. The finished roadway cross section has 4-foot shoulders on a 1-inch to 1-foot slope flanking the pavement. In fills the side slopes are 4 to 1, while in the cuts slopes are 2 to 1. The entire road has a gravel base course extending out through the shoulders; in fill sections this gravel base is 18 inches thick, while in cuts it is 24 inches in depth.

Treated-Gravel Leveling Course

On top of this gravel base there is a 1-inch surface-treated gravel leveling course 26 feet wide on which the pavement is laid. Gravel for this course was screened in the borrow pits over a 1¼-inch-square mesh sieve. Besides the maximum size requirement, the specifications called for at least 50 per cent of the material to be ¼ inch in size or over. The leveling-course gravel averaged 8 cubic yards for each 100 linear feet of highway. It was spread by a motor grader, and then compacted to its 1-inch thickness by a 10-ton 3-wheel roller.

Next the course was surface-treated with RT-5 tar applied at 120 degrees F at the rate of 0.4 gallon to the square

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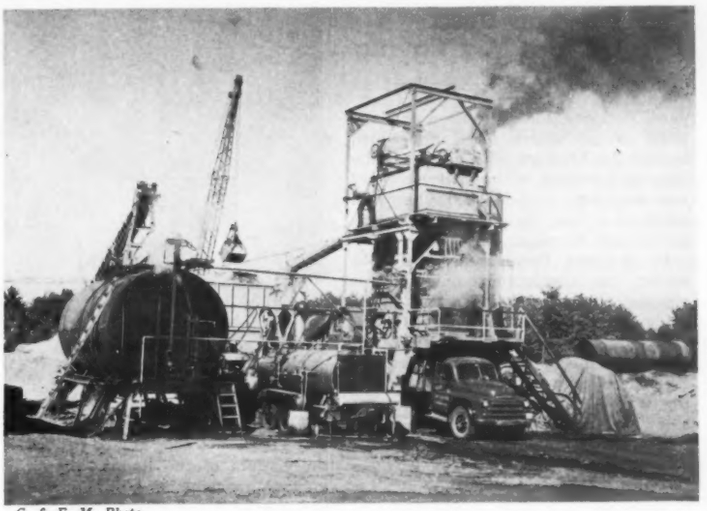


C. & E. M. Photo

A truck gets its load of hot-mix for the Maine contract at the Warren Bros. asphalt plant. The asphalt storage tank is at the left and the fuel-oil tank at right.

Local Gravel Used In Hot-Mix Paving

(Continued from preceding page)

yard. Koppers, Inc., furnished and applied the tar with a distributor which hauled the bitumen 30 miles from the base at Portland, Maine. The shooting was done with a 13-foot spraybar, half width at a time, in order to maintain traffic over the road.

By working through the 1949-1950 winter, the contractor completed his grading, the construction of two small bridges, and the surface-treated leveling course, so as to begin the bituminous-concrete paving work early in August. By the end of September the highway surfacing was finished; the sidewalk work was completed in October; and the remaining items in the contract were cleaned up by November.

Subcontracts

Frank Rossi, the prime contractor, subcontracted most of the paving operations by having the Lane Construction Co. of Meriden, Conn., supply the gravel aggregate and lay the hot-mix, while the Warren Bros. Roads Co. of Fairfield, Maine, did the actual mixing of the bituminous concrete in one of its own plants. A crusher and an asphalt plant were set up in a gravel borrow pit west of the center of the job from which the maximum haul of trucks delivering the mix was only 6 miles.

A Lima ¾-yard shovel dug the gravel from around the perimeter of the pit, and loaded the material into a 5-yard truck which dumped it into a receiving hopper. From a feeder at the bottom of the hopper the gravel moved up a conveyor belt to a Diamond portable crushing plant. The processed gravel moved over another conveyor belt to a stockpile at the asphalt plant. A Caterpillar D17000 diesel engine ran the crusher, with a Caterpillar D8800, a 50-kw diesel-electric unit, supplying power to the two motors operating the conveyors.

C. & E. M. Photo
In Waterboro, after rakers level off the sidewalk top course, it is rolled by a Buffalo-Springfield 2 to 3-ton tandem roller.

A stockpile containing 4,000 tons of gravel aggregate was on hand before the asphalt plant got into production. The plant was a Warren Bros. portable road unit, No. 525 in the 500 Series. Its main power plant was a Caterpillar D13000 diesel which turned the main drive wheel through a 16-inch belt. This wheel and a system of countershafts ran the cold elevator, dryer, screens, and pugmill. Another Caterpillar unit, a D318 diesel-electric 40-kva set, supplied power to motors through flexible rubber cables for the operation of the rest of the plant. These separate motors included a 25-hp unit on the blower fan; two 5-hp motors to run the feed pump and a blower on the boiler; a 1-hp motor on the fuel-pump; and a ½-hp unit for the water pump. Water for the plant operation came from two wells on the site which were dug to a depth of only 8 feet.

Asphalt Plant

Although the plant was a portable setup, concrete footings were poured to support the dryer, dust collector, mixing tower, and the main diesel power plant. Timber blocks or sills served as foundations for the other major parts of the plant including the aggregate hopper bin, boiler, asphalt tank, and diesel-electric unit.

Asphaltic cement, 85-100 penetration, used in the mix was furnished by the Colonial Beacon Oil Co. of Everett, Mass., and delivered to the plant by the Trimount Bituminous Co., also of Everett, employing 3,500 to 4,000-gallon tank trucks for the haul. The bitumen was stored in a 10,000-gallon insulated horizontal tank, and pumped to the pugmill through a steam-jacketed line

(Concluded on next page)

by a Warren Bros. 3-inch gear pump driven by a Troy steam engine.

The Gulf Oil Co. of Portland, Maine, furnished the plant with No. 2 fuel oil. It was stored in a 3,000-gallon horizontal tank laid out on ground that was a few feet higher than the general level of the plant site. Thus the oil flowed by gravity to the fuel pump, boiler, and power units.

When the fine-aggregate sand was deficient in material passing the No. 200 sieve, Cal Stone was added to the mix. This standard ground cultural lime filler was supplied in bags by the Lawrence Portland Cement Co. of Thomaston, Maine. When needed it was added to the mix by hand. For most of the job the sand was so well graded that the filler was unnecessary.

Aggregate Movement

From the crushed-gravel and sand stockpile, a Northwest crane with a 50-foot boom and an Owen ¾-yard clamshell bucket loaded the aggregate into a 20-ton receiving bin. At the bottom of the hopper a roll feeder moved the material along to a 12-foot-high cold elevator at the top of which it was discharged into the high end of a Pacific-type dryer, 60 inches in diameter x 18 feet long. The aggregate was heated by two oil-fired burners, a Gem and a Hauck, at the lower or discharge end of the dryer. Only one burner had to be fired at a time. Steam for the burners, and other plant needs, was supplied by a Cleaver-Brooks LFM 88 steam generator mounted on rubber tires. This fully automatic 80-hp boiler delivered steam at 150-psi pressure.

Dust and fumes from the dryer were drawn off into a dust collector by a 55-inch-diameter blower fan operating at 25,000 cfm. At the bottom of the cone-type collector a worm gear moved the fines, that had settled down, to the bottom of a 40-foot-high hot elevator. Gravel and sand, along with the fines, went up the elevator to a rotary screen where the material was graded into four sizes and dropped into four bins with a total capacity of 30 tons.

Two sets of Howe dial scales measured the asphalt and aggregate before they were admitted into the 1-ton pugmill. Mixing time for the 2,000-pound batch was 1 minute and 3 seconds. Steam-controlled gates released the hot-mix into trucks below which had backed under the tower. The prime contractor hauled the bituminous concrete to his own fleet of 8 Dodge trucks carrying 7 tons a load.

The Mix

The contractor worked a 58-hour week—five days at 10 hours and 8 hours on Saturdays—producing an average of 3,000 tons of bituminous concrete. Top output for a single 10-hour day was 722 tons.

Gradation requirements in the composition of the mix were as follows:

Sieve Size	Per Cent Passing
1-inch	100
¾-inch	95-100
½-inch	70-88
No. 4	46-60
No. 8	32-47
No. 40	10-26
No. 80	4-18
No. 200	3-8
Bitumen (per cent of mineral aggregate)	5-6

Typical weights of a 1-ton batch, based on the aggregate measured from the four bins at the plant, were as follows:

¾-inch gravel	440 lbs.
½-inch gravel	360 lbs.
⅜-inch gravel	320 lbs.
Sand	740 lbs.
Filler	40 lbs.
Asphaltic cement	100 lbs.
Total	2,000 lbs.

On the Road

On the road the mix was laid at temperatures ranging between 250 and 300 degrees F and in two 1½-inch courses for a total width of 24 feet. An Adnun Black Top Paver laid the material, putting the base down in lanes 11½ and 12½ feet wide, and the top course in two 12-foot lanes. In this manner the joint was split to prevent cracks from occurring the full depth of pavement along the center line. For every 100 linear feet of full-depth 24-foot pavement, 42 tons of plant-mix was required. Each course was compacted by two Buffalo-Springfield rollers—a 3-axle 12 to 16-ton tandem and a 12-ton 3-wheeler.

Like the road surfacing, the 5-foot sidewalks in Waterboro also have a total 3-inch depth of bituminous concrete laid in two 1½-inch courses. The same mix is used throughout in both layers of highway and walks. Material for the sidewalks was spread with rakes and shovels on a 5-inch gravel base course. Each lift of blacktop was compacted by a Buffalo-Springfield 2 to 3-ton tandem roller.

Quantities and Personnel

The major items included in the 7.68-mile road contract were as follows:

Unclassified excavation	140,000 cu. yds.
Common borrow	45,000 cu. yds.
Gravel borrow	130,000 cu. yds.
RT-5 tar	70,000 gals.
Bituminous concrete	19,000 tons

At the peak of operations a force of 50 workmen was engaged on the Maine project. Frank Rossi, the general contractor, was represented by F. N. Rossi, Superintendent. For the Lane Construction Co. Charles Phillip was Superintendent, while Ernie Watson was Plant Superintendent for Warren Bros. Roads Co.

For the Maine State Highway Commission, Paul Mansfield was Resident Engineer assisted by Harold Bessey and Vincent Leblanc. The Commission is headed by Lucius D. Barrows, Chief Engineer.

Correction on Heater Item

It has recently been called to our attention that the portable Hy-Lo Hotshot forced-air heater will deliver 300,000 Btu's per hour at a consumption of 2¼ gallons of fuel oil—rather than 4¼ gallons as stated on page 73 of the December issue.

Complete information on this product may be obtained from the manufacturer, Scheu Products Co., Ltd., Upland, Calif. Or use the Request Card at page 16. Circle No. 497.

Bulk-Cement Haulers

The Trailmobile Co., 31st and Robertson Ave., Cincinnati 9, Ohio, has developed a new bulk-cement hauler with a capacity of 118 barrels. Bulk shipment can cut the cost of handling cement in bags about 37½ cents per bag, the company says—and save loading and unloading time. The new Trailmobile unit may be loaded through any one of the four 24-inch hatches in about 6 minutes and unloaded by rotating screws in less than 15 minutes, the company says.

Tank and frame on the new unit are integral, and constructed of high-tensile steel. The tank has a heavy-gage bottom to resist cement abrasion. The roof is supported by the bulkhead to resist damage from walking. Ladders and a catwalk are provided for accessibility to the four fill openings. Each opening has a waterproof self-sealing cover extending over the edges. Two openings are usually used for filling—the other two for topping or leveling off the load. Vaporproof wiring and standard tank lighting are provided. The unit is carried by eight 12-ply tires, 10.00 x 20.

Dry cement is about to be loaded at the plant into one of the four 24-inch hatches of a Trailmobile bulk-cement unit. Rotating screws, extending the length of the trailer, can expel the load of 118 barrels of cement in less than 15 minutes.

The outlet for unloading consists of a 12-inch-diameter Neoprene rubber tube approximately 26 inches long, which may be folded flat and clamped tight to prevent leakage of cargo during the haul. The Trailmobile bulk-cement unit is unloaded by a twin-section screw. Both the rear screw and the front screw are driven from the center of the unit. Over the screw at regular intervals are hoods with open sides, so that the direct weight of the cement on the screw is proportioned to provide proper feed without undue loading on screw blades and bearings.

Further information on the Trailmobile bulk-cement unit SC-662 may be secured from the company. Or use the Request Card at page 16. Circle No. 546.

New Radiotelephone For Two-Way Contact

A new portable FM radiotelephone for 2-way communication in the field has been developed by Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill. The Littlefone is a complete portable 2-way radio station in a single compact unit. It contains a 10-tube FM transmitter and an ultrasensitive 12-tube receiver, both of which are crystal-controlled. It is powered by self-contained storage batteries which may be recharged from a 6-volt car battery or 115-volt ac line.

This portable field communication unit may be obtained in hand-carry or back-pack type. It comes in four models having ½, ¾, 1, and 2-watt capacities. "Squelch" is available on all models. Dry-battery operation is optional. All models comply with FCC regulations, the company says.

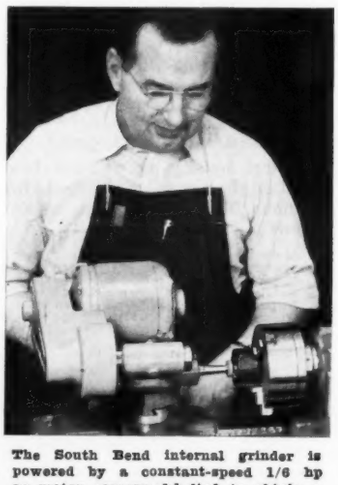
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 470.

An Internal Grinder

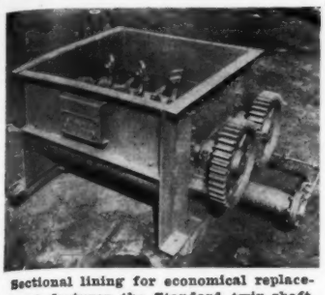
A new precision internal grinder has been developed by South Bend Lathe Works, South Bend 22, Ind. It is powered by a standard type of 1/6-hp 3,450-rpm ac motor which operates at constant speed and gives continuous duty. The motor is compound-belted, through an intermediate shaft to obtain a quill-spindle speed of 30,000 rpm.

Four arbors are supplied, the longest permitting a hole 3⅞ inches deep to be ground when using a 1-inch wheel. Four grinding wheels are included with ¼-inch face and ¼-inch bore, and ⅝, ¾, ⅞, and 1-inch diameters. In addition, a ⅛-inch chuck is supplied so that the various sizes and shapes of mounted grinding wheels may be used and holes down to ⅛ inch may be ground. Any grit and type of high-speed wheel having a ¼-inch arbor hole or mounted on a ⅛-inch shaft may be used as required.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 471.



The South Bend internal grinder is powered by a constant-speed 1/6 hp ac motor compound-belted to obtain a quill-spindle speed of 30,000 rpm.



Sectional lining for economical replacement features the Standard twin-shaft mixer for Series SM asphalt plants.

Asphalt-Plant Mixer With Sectional Lining

A new all-steel twin-shaft mixer, featuring sectionalized lining for easier and more economical replacement, has been developed by Standard Steel Corp., 5001 Boyle Ave., Los Angeles 58, Calif. It has a welded-steel one-piece body completely lined with removable cast-alloy liners, and is designed for use in Standard's Series SM asphalt plants, available in 1,500, 2,000, 3,000, 4,000, and 5,000-pound capacities. The machine is available in two models and is adaptable to all makes of asphalt-mixing plants, Standard says.

Instead of being one solid piece, the lining surface of the mixer consists of several smaller sections bolted to the body from the outside. No holes or bolts extend through the wearing surface. The company points out that roller bearings are employed in place of sleeve bearings to reduce the horsepower required for operation.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 507.

Device Cleans Conveyor Belts; Centralizes Load

A new device for centralizing the load on conveyor belts and at the same time ridding the belt of dust or sticky materials was announced in the September issue of "Rubber Developments", a quarterly publication of The British Rubber Development Board.

The device consists of a heavy-duty idler roller to which are vulcanized four or more ribs of specially compounded rubber. As the roller revolves, the ribs tap the belt slightly, and the resulting vibration causes an oscillatory movement of the belt which helps to centralize the load. When the same type of roller is used with the bottom or return belt, it sets up a similar vibrating action and assists in the removal of any dust or sticky material adhering to the belt.

Copies of "Rubber Developments" are available free of charge from the Natural Rubber Bureau, Dept. S-50, 1631 K St., N. W., Washington 6, D. C.

For Metal Protection

Literature describing Powerfilm, a protective coating for metal surfaces, has been offered by The Thomas Co., 1645 Hennepin Ave., Minneapolis 3, Minn. It suggests applications of the product, describes its properties, and gives directions for application.

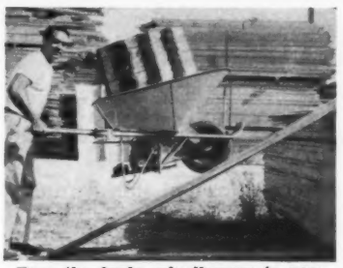
The circular points out that when Powerfilm is applied to snowplow moldboard surfaces it provides a protective water-resistant film which reduces surface friction and thereby eases plowing effort. The company recommends the product for tools, implements, and other equipment to protect the metal surfaces against rust and corrosion. It also explains that Powerfilm will go under and displace water, providing an effective protection even where the surface is not completely dry.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 496.

A New Power Barrow

A new power wheelbarrow with a capacity of 4.1 cubic feet has been developed by the S & S Vending Machine Co., San Jose, Calif. It is powered by a 1-hp gasoline engine and has a speed on level surfaces of approximately 3 mph. It will pull loads up a 40 per cent grade, the company says. Compression acts as a brake on the downgrade.

The Pow-R-Barrow is 67 inches long, 29 inches wide, and 27½ inches high overall. It has an overall weight of 105 pounds with the weight at the handles only 27 pounds. There is no clutch drive, the barrow being driven by friction of the rotating driveshaft against the pneumatic tire. Linkage between the driveshaft and the engine is by belt. Movement of the right handle engages and disengages the driveshaft. The compact air-cooled engine is neatly set within the supporting frame of the barrow.



Even the lowly wheelbarrow is powered these days. The Pow-R-Barrow will climb a 40 per cent grade fully loaded and travel on the level at normal walking speed.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 545.

Noted Steel Man Dies

One of the nation's leading steel-construction engineers died in December in his home in Bethlehem, Pa.—Edwin J. Paulus, General Manager, Fabricated Steel Construction, Bethlehem Steel Co. He supervised the fabricated steel construction of many notable bridges, buildings, and other structures, including the Golden Gate Bridge at San Francisco, the Rainbow Bridge at Niagara Falls, and the Waldorf-Astoria Hotel in New York.

Building Contractors Face Wartime Curbs

Construction Industry Is Warned of Restrictions at 55th Annual Meeting of New York State Group

• IMPENDING restrictions on building construction were brought sharply to the attention of delegates attending the 55th Annual Convention of New York State Building Industry Employers held in New York City, December 14 and 15. The impact of such war controls was the theme of the meeting, which brought together some 300 building contractors from 23 cities representing a state-wide membership of 2,216. The gathering was held in the clubrooms of the Building Trades Employers' Association of New York City, the largest single affiliate of the BIE. Membership includes some of the largest general contractors in the country who handle commercial and industrial construction along with large housing developments.

A warning not to depress the civilian economy on which our traditionally high living standards depend was voiced by Admiral Carl H. Cotter, (CEC), USN (Ret.), President* of Merritt-Chapman & Scott Corp., at the opening-day session. "The country's productive capacity must be stepped up", said Cotter, "to the point where it can meet without strain both the extraordinary demands of our military requirements and the minimum demands of our ever-expanding civilian economy." This is the only answer, the ex-Navy chief declared, to the problem that will "haunt the United States as long as it is forced to remain in a state of partial or complete mobilization."

With a look to the future, Cotter pointed out that "statistics are almost meaningless in the present picture, for we are in the midst of a situation that can cause intensive shifts in planning overnight." He did cite estimates predicting that the 1951 dollar volume of new construction is expected to be from 10 to 20 per cent below this year's estimated record of $26,000,000,000. Mentioned also were surveys forecasting that 1951 housing construction will be down from 35 to 40 per cent, with an acceleration of industrial and military construction offsetting some of this downward trend.

The M-C&S head suggested a five-point program to contractors through which each "can personally help mobilize the country's construction industry for the vital role it must play in both the short-term and long-range national preparedness drives." The plan to protect the industry's potential strength embraced the five M's of Mobility, Manpower, Materials, Maintenance, and Management. Admiral Cotter's speech, with the details of this stimulating challenge, may be found on page 3 of this issue. Though delivered in the waning days of 1950, it offers a clear-cut perspective on how contractors may be shaping their thinking for the months that lie ahead.

Impact of NPA Controls

"Only a united, self-controlled industry can avoid future drastic restrictions and consequent serious influences from defense mobilization, imposed on construction activities" was the strong warning voiced before the convention by Carlton S. Proctor of the consulting engineering firm of Moran, Proctor, Freeman & Mueser, New York City. He urged the building industry to "organize its own disciplinary procedures to effectuate necessary cooperation with the national defense program, such as to encourage the minimum workable amount of Federally imposed restriction, allocation, and price-fixing."

Last fall Proctor took a leading part in three conferences with Gen. William A. Harrison, National Production Authority Administrator, prior to the enforcement of Regulation M-4 on October 27, which prohibited certain types of construction. The consultant emphasized that in his meetings with the NPA head he urged that the construction industry "be given an opportunity to develop workable self-regulation before being put into the strait jacket of Federal regulations, controls, allocations, and priorities."

As a result of protests from leaders in the construction industry, Proctor pointed out, Order M-4 was amended, and subsequent restrictions issued by NPA adopted the principle "urged upon the NPA by the construction industry, to allocate armament requirements at the source and thus give industry the opportunity to develop a workable pro-

(Concluded on next page)

* On January 31, Admiral Cotter resigned as President and a director of Merritt-Chapman & Scott, to devote his time to activities connected with the national preparedness program. He will continue his association with the firm as consultant.

Francis Byrne (right) of the Byrne Construction Co., Syracuse, newly elected President of the Building Industry Employers of New York State, is congratulated by Hugh M. Hughes, whom he succeeded at the convention.

cedure for distribution of remaining products, and to encourage incentive for development of substitute products." This, he stressed, should be accepted as a challenge to industry integration.

Proctor, who spent several years in Russia directing the construction of major industrial projects, expressed the opinion that "the peacetime imposition of Federal controls and allocations must, for its administration, require a large increase in the bureaucratic overburden to our economy, and that such bureaucratic extension may . . . provide such impetus to our trend toward a managed economy that, in fighting this war to prevent a third world war, we may . . . wind up with a paternalistic government of state socialism closely approaching the same socialist state that we are now fighting and the totalitarianism that we opposed through two world wars."

Contractors' Proposal to NPA

The convention recommended to the National Production Authority the amendment of Order M-4 to provide that "commence construction" shall mean the awarding of a contract, and that the commencement of construction shall take place within a specific and reasonably adequate period after such awarding. The contractors also recommended that the NPA allocate to national defense necessary strategic materials, and leave the construction industry to maintain its economy with what remains and with substitute materials as necessary. Thirty days' notice was requested before the institution of further controls.

At a press conference preceding his talk on "The Building Industry Today and Tomorrow" before a closed session of the convention, Richard Cole, member of the National Joint Board for the Settlement of Jurisdictional Disputes, Building and Construction Industry, voiced the opinion that an early shutdown of all private building construction is possible. Cole, who is Executive Secretary of the Tile Contractors Association of Washington, felt that restrictions, along with wage and price controls, would be coming much faster than anyone imagines.

At the final open session, Cornelius J. White, New York State architect, predicted a high level of state work in the next fiscal year starting April 1, 1951, if the imposition of Federal controls did not stop all work.

New Officers

Francis Byrne, head of the Byrne Construction Co. of Syracuse, N. Y., was elected to the presidency of the Building Industry Employers of New York State, succeeding H. M. Hughes of New York City. The new Vice President is Maurice Rowley who is President of Swartout & Rowley, general contractor of Rochester. William J. Picard of Albany was re-elected Secretary-Treasurer.

For Ice and Sleet Control

A folder and specification sheet on the 4-U family of Champion spreaders, designed for ice and sleet control, is offered by Good Roads Machinery Corp,. Minerva, Ohio. These units will spread sand, salt, cinders, calcium chloride, and other materials in a free and uninterrupted spread of 270 degrees.

The literature points out that features of the spreader include a spinner-disk propelled through a gear box by the dual pneumatic tires; an adjustable agitator cone to regulate the flow of material and prevent clogging; adjustable hinged deflector plates to control the width of spread regardless of truck speed; and a self-centering self-locking truck hitch. Illustrations of the unit and its component assemblies, plus complete specifications, are included in this catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 528.

New Two-Way Radio A Compact Field Unit

The new RCA Carfone Station Unit "15" developed by Radio Corp. of America, Engineering Products Department, Camden 2, N. J., is built for rugged communication service in the construction industry. This 15-watt portable radiophone is both transmitter and receiver and can be plugged into any 110-115-volt ac outlet. The operator can then contact either home office or other mobile units in the field.

The Carfone is complete with transmitter, receiver, power supply, portable antenna, handy microphone, and loud speaker—all in a single package. Improved receiver selectivity reduces adjacent-channel signals well below interference levels, the company says. Transmitter modulation controls enable transmission of the full signal potential of the transmitter, RCA says, and maintain 100 per cent modulation at virtually all voice levels. This unit operates in the 152 to 174-megacycle range and has the model designation Type CTR-1A.

RCA's Carfone Station Unit "15" is a 15-watt portable radiophone specifically designed for construction-industry service. It is both transmitter and receiver, and can be plugged into any 110-115-volt ac current outlet.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 541.

New Diesel Engine In 20 to 30-Hp Range

A 2-cylinder engine to supplement the Type 4FS1 single-cylinder 10 to 15-hp diesel engine has been announced by Nordberg Mfg. Co., Milwaukee 7, Wis. Rated at from 20 to 30 hp within an operating-speed range of 1,200 to 1,800 rpm, it has a 4½-inch bore and a 5¼-inch stroke and is a heavy-duty vertical 4-cycle mechanical-injection diesel engine.

This 4FS2 engine is built as a complete self-contained ready-to-operate unit and is offered as an electrical generating set, a pumping unit, and with clutch or stub-shaft power takeoff for direct connection or belt drive. With the new addition, the Nordberg 4FS line of diesel generating sets provides electric-power sources in dc or ac models from 6 to 20 kw in all standard voltages, 50 or 60-cycle. The 4FS centrifugal pumping units now cover a range of from 200 to 2,400 gpm at from 25 to 220-foot head.

Electric starting equipment, including starting motor, battery-charging generator, and voltage regulator, is available on all models along with manual starting. The engines can also be supplied for manual starting only, if desired. Full-pressure lubrication is provided to main, connecting-rod, piston-pin, and camshaft bearings, and to the rocker-arm assembly. Lube-oil circulation is maintained by a gear-type pump located in the sump.

A diaphragm-type fuel-oil transfer pump, actuated by the camshaft, can also be operated manually for priming. It is arranged to deliver fuel through a filter to the fuel-injection pumps. A mechanical flyball-type governor, gear-driven from the camshaft, regulates fuel delivery in accordance with engine load requirements. Engine speed is controlled by adjustment of the governor.

A radiator-type system cools the combustion chamber, fuel-injection nozzles, valves, and exhaust passages.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 519.

Portable Detector Unit Locates Pipe and Cables

A 4-page folder about a portable unit for locating pipe and cables prior to trenching or excavating is offered by The Detectron Co., 5631 Cahuenga Blvd., N. Hollywood, Calif. The Detectron 505, the literature points out, will determine the exact location and depth of buried or hidden pipes, valves, boxes, services, manhole covers, communication cables, and other known or unknown metallic objects. Its features include an aluminum case, shielded loops, unit construction, a lifetime guarantee, and a drop handle for carrying.

The folder illustrates the unit in use and explains that anyone can operate it with complete accuracy by following the simple operating procedure. Photos also illustrate the damage that can be caused by not locating service lines properly prior to excavation.

For contractors who think they might be able to cash in on that $10,000 offer of the United States government for the location of uranium, the Detectron Co. also makes a small portable Geiger counter. Who knows?—your bulldozer or scraper team might be turning over valuable uranium right now on one of your jobs.

Literature on the pipe detector and the Geiger counter may be obtained from the company, or by using the Request Card at page 16. Circle No. 536.

Calomatic taglines come in five reel sizes, offer a variation in pull between 75 and 400 pounds, and have an operating range of 65 to 95 feet.

Easy Bucket Control With 5 New Taglines

A new automatic tagline, available in five sizes, has been developed by Bert Calvert, and is being manufactured by the Calomatic Equipment Corp., 4546 E. Washington Blvd., Los Angeles 22, Calif. This tagline, the company says, makes bucket handling easy, since it provides an automatic and constant tension with a maximum variation of 20 per cent.

The Calomatic taglines are designed for all crane models with buckets up to 3½ cubic yards. With five reel sizes, 14 to 30-inch diameters, and variation in pull between 75 and 400 pounds, the new models have an operating range of 65 to 95 feet maximum.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 477.

A 2½-Yard Electric Shovel

A new bulletin outlining the design and operation features of the Marion Type 93-M Ward-Leonard electric-powered excavator has been prepared by Marion Power Shovel Co., 617 W. Center St., Marion, Ohio. This 2½-yard unit incorporates Marion Ward-Leonard electric controls for all major operating motion including hoisting, swinging, propelling, and crowding.

Bulletin No. 401 reports that economical and high-speed operation results from the use of new and compact 600-line motors. The small size of these motors is said to give them low armature inertia, permitting faster starting, stopping, and reversing. The literature describes all important design and construction features. It gives condensed specifications for the excavator in use as a shovel or dragline. An overhead photograph of the operating machinery shows it to be compact and accessible.

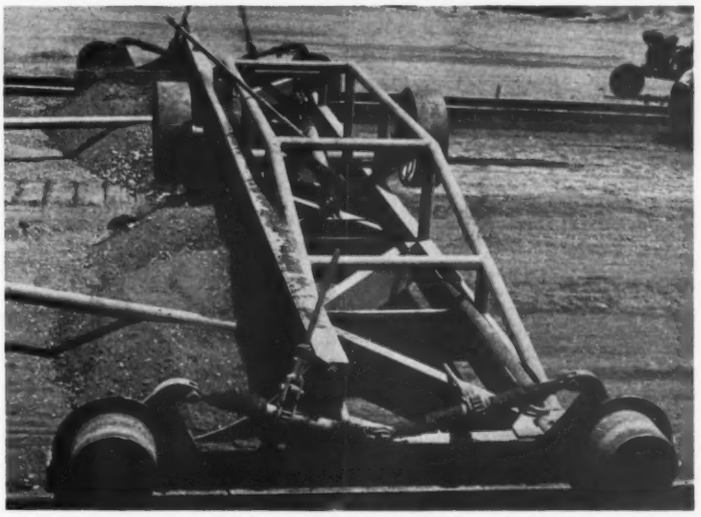
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 539.

A Subgrade Planer

The new Ferguson subgrade planer, designed to cut an accurate subgrade up to 25 feet wide for concrete paving, is now being manufactured by Shovel Supply Co., P. O. Box 1369, Dallas 1, Texas. Weighing 10,000 pounds, this new unit is ruggedly constructed; it will not deflect under extreme loads, according to the company.

The blade will cut from 6 to 14 inches in depth and is instantly adjustable up and down by ratchet jacks acting independently on each wheel. The curved moldboard uses standard grader blades for flat grades, or special blades can be furnished to cut any contour of grade desired. The planer is said to be easy on forms because of its Timken-bearing automotive-type wheels. Pull bars attach to a tractor and the transporting wheels can be raised or lowered. A removable tongue is provided.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 432.



Shovel Supply Co. makes the new Ferguson subgrade planer, designed to cut an accurate subgrade, up to 25 feet wide, for concrete paving.

Tunnels Sawed, Lined

Contractor Silas Mason Asks Patent Rights on Unusual Shop-Built Jumbo Carrying Saw and Pneumatic Drills

By RAYMOND P. DAY,
Western Editor

• NEAT-LINE tunnel sawing, the thing which couldn't be done at Fort Peck, has been made to work at Fort Randall Dam by Silas Mason Co. of Shreveport, La. Machinery was developed that was so efficient in carving out the 12 big tunnels on the $165,000,000 Corps of Engineers project that the contractor has applied for patent rights.

The 12 tunnels in Mason's $8,585,808 contract will carry the Missouri River through the dam. Eight of the tubes will train water through penstocks into the big 320,000-kw powerhouse. Four tubes are for flood control, and will pass ordinary excess flow. The 12 tunnels, side by side, pass through Niobrara chalk under the left abutment, less than a mile from the Dakota Territory fort where Sitting Bull was held an army prisoner in 1882.

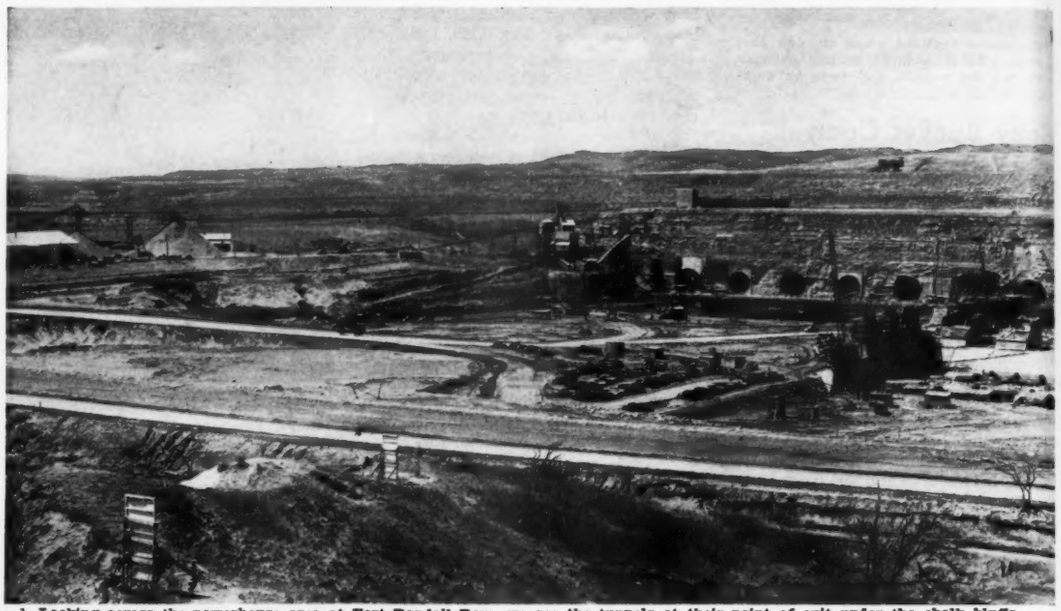
Pioneer earthwork by Western Contracting Corp. had demonstrated the feasibility of cutting the soft chalk formation to neat lines by conventional chain machines and coal saws. How to make a coal saw work while it was turned upside down and side ways on a circular cut was something else again. The first two tunnels were started by line drilling with coal augers. The augers drifted off location, and the series of holes was a slow and costly process. Sawing of the periphery had been given serious consideration from the time the job was prospected, but the solution of numerous difficulties involved was worked out by R. B. Jewell, Resident Manager for Silas Mason Co., and George Lyle, General Superintendent, only after failure of the line-drilling method to produce satisfactory progress.

They took a Goodman No. 324 slabbing saw, and kept the blade, drive head, and trunnions. They had to devise a whole new lubrication system to make sure that oil got to all the vital parts. The conventional 50-hp electric drive motor was too small, so they figured the clearance closely and put a 75-hp motor in its place. Another bug was solved.

How should the saw be mounted so

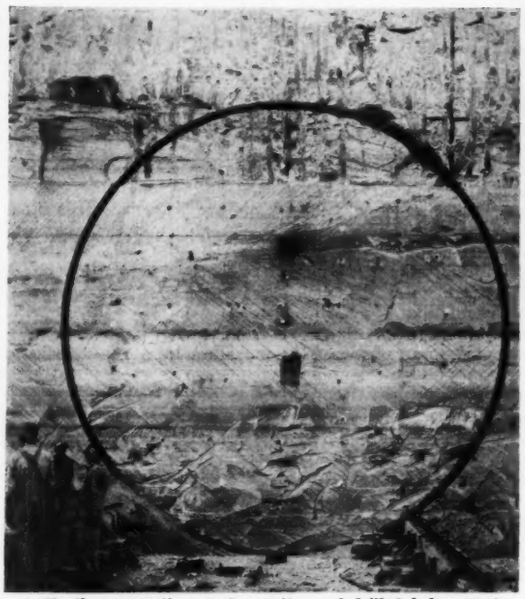
(Continued on page 46)

Silas Mason Co. Photos

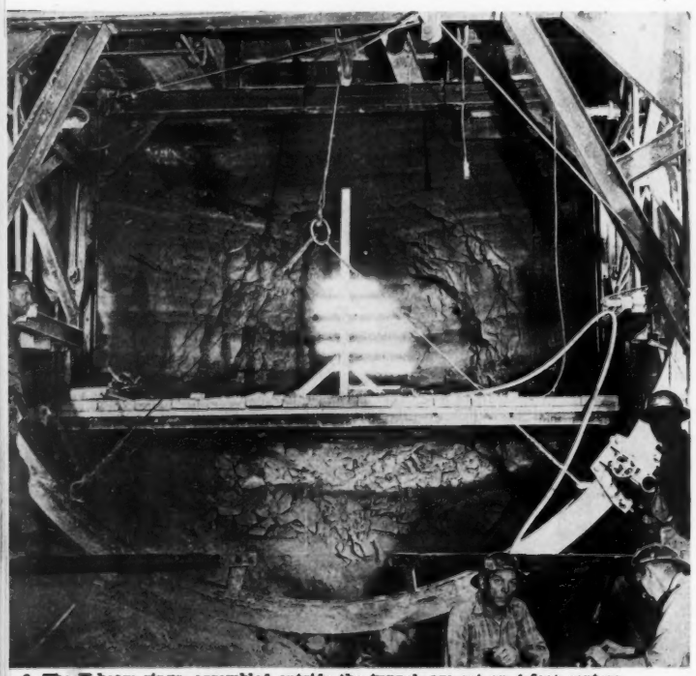


1. Looking across the powerhouse area at Fort Randall Dam, we see the tunnels at their point of exit under the chalk bluffs.

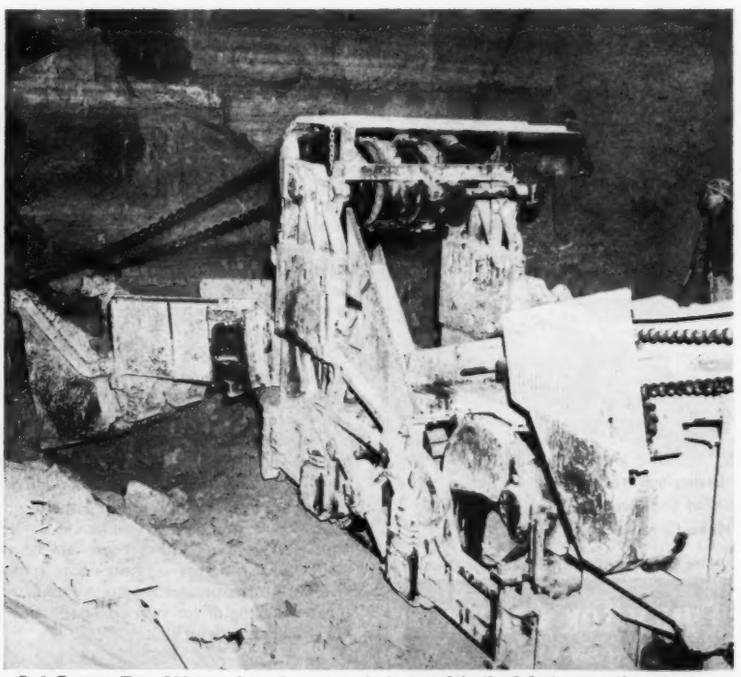
3. The coal saw leaves a nice 6-inch slot in the chalk as it takes a cut at the bottom of the circle.



4. Neatly sawed lines and a pattern of drilled holes greet the powdermen when they move in to load.



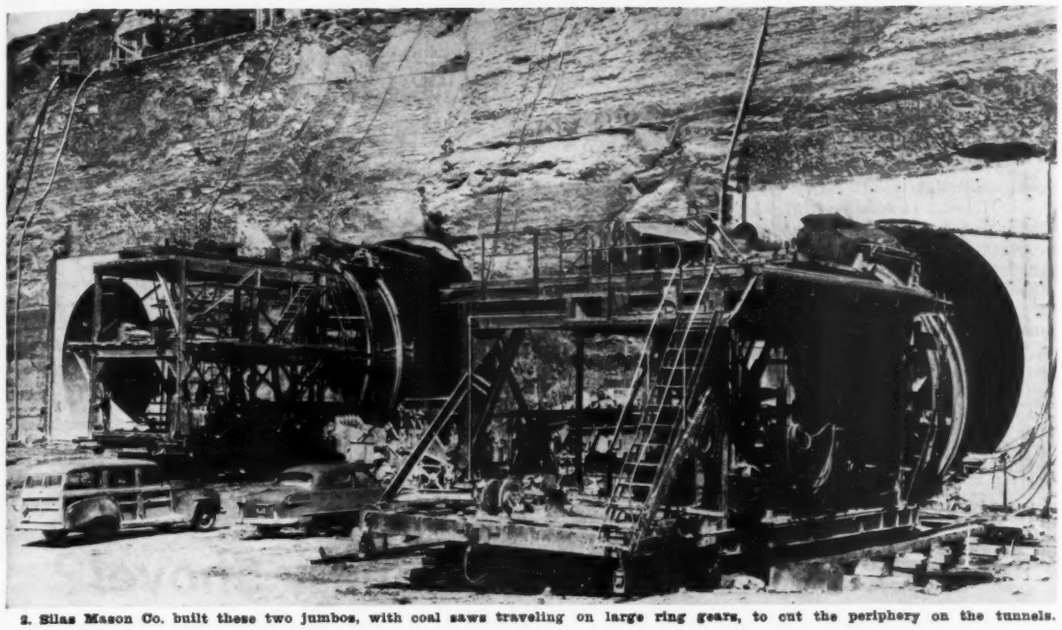
6. The H-beam rings, assembled outside the tunnel, are set on 4-foot centers.



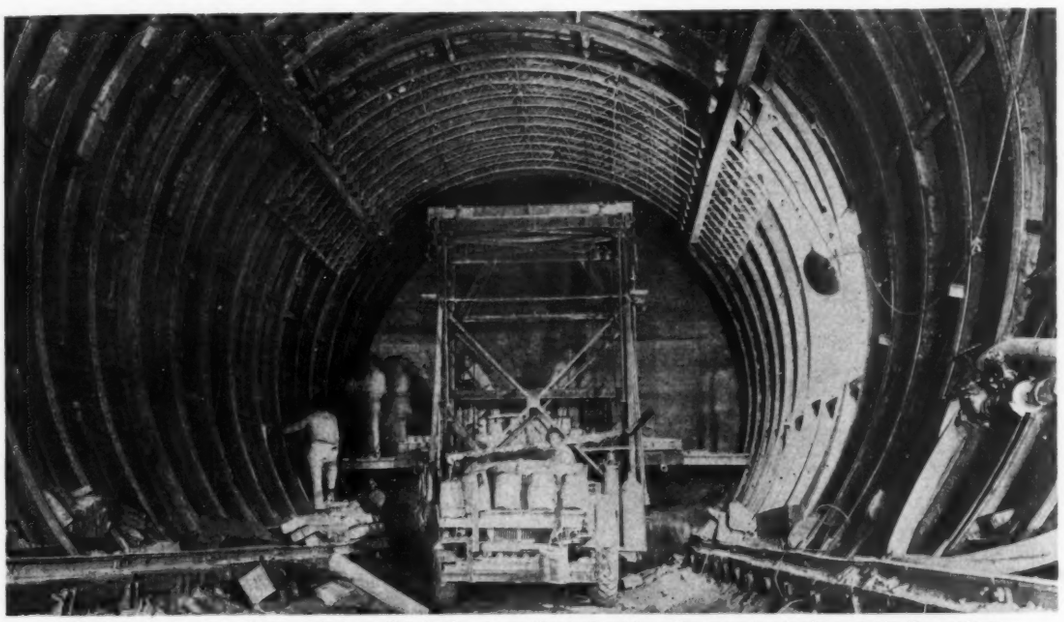
7. A Conway Type 100 tunnel mucker moves in to complete the 8-foot excavation round.

At Fort Randall Dam

Lining Placed in 24-Foot Pours Behind Steel Forms As Refrigeration Machines Cool Concrete Temperature



2. Silas Mason Co. built these two jumbos, with coal saws traveling on large ring gears, to cut the periphery on the tunnels.



5. Bracing rings are set from a steel-erection jumbo. A cantilevered safety grille over the jumbo protects the workmen.

• CONCRETE placing temperatures in the tunnel linings at Fort Randall Dam were held between 50 and 65 degrees. Considering the heat buildup due to friction in Pumpcrete lines up to 1,900 feet long, it was quite a feat. Work went on summer and winter, with the exception of a week's shutdown due to a March blizzard.

Silas Mason Co. of Shreveport, La., built the 12 tunnels. An $8,585,808 contract with the Omaha District of the Corps of Engineers covered the cost to the Government of the mammoth tubes under a chalky South Dakota hill near Lake Andes on the muddy Missouri River. Tunnel excavation and lining were included in the contract.

A further refinement in concrete technic was seen when crews under Resident Manager R. B. Jewell vacuumed the inverts of three of the four flood-control tunnels, and the small section of the fourth tunnel, No. 10, which will be used for fine regulation. Eight tunnels were planned for power generation. Four were for flood control.

Nine tunnels start off 28 feet in finished diameter. This diameter holds for 658 feet; then breaks abruptly in a transition to 22 feet ID for 215 feet. On these tunnels the larger diameter is near the powerhouse. Later on, when another contract is let, steel penstock liner plate will be placed in the 28-foot tube to make a finished steel tube 22 feet in diameter. Water will then pour in through the concrete-finished part of the tube, and pass through the steel lining to the big turbines connected to the 40,000-kw generators.

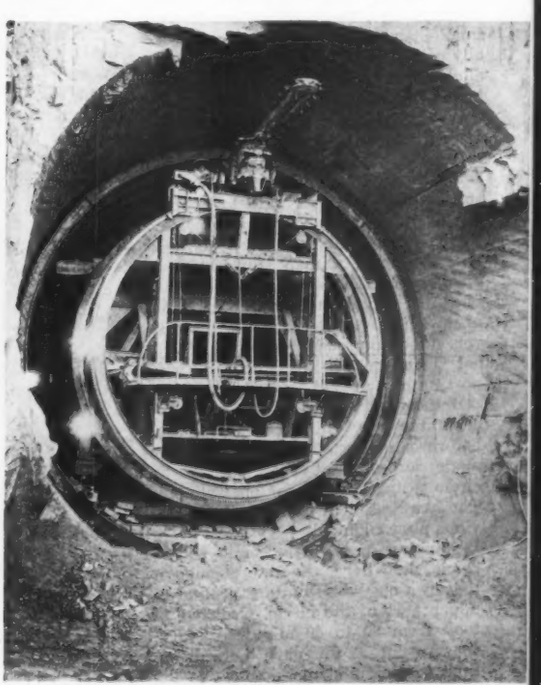
Three of the four outlet tunnels slated for flood control were lined with concrete throughout, and are 22 feet ID all the way. Concrete lining in both the large and small-diameter tunnels consisted generally of 30 inches of heavily reinforced concrete.

Each tunnel lining consisted of a series of 24-foot monoliths. Lining began at the downstream end, and in both directions from the transition with a closure pour through the crown in the center of the large-diameter section. Pours were made consecutively in practically all cases.

Some idea of the difficulty of concreting can be gained from the fact that 11,763,000 pounds of reinforcing

(Continued on page 48)

8. A Euclid end-dump gets a load of blasted rock from the mucker. A special drawbar speeds the job.



9. The saw rig holes through; another tunnel completed.

Driving the Tunnels At Fort Randall Dam

(*Continued from page 44*)

it would cut to the best advantage? Jewell and his men decided to place the saw on a ring gear the size of the tunnel diameter, or close enough so the saw would cut the proper diameter. That meant two ring gears and two mounts and two saws, because the finished inside diameter, including 2½ feet of reinforced-concrete lining, was 28 feet on some tunnels and 22 feet on others.

Two special jumbos were then designed to carry the slabbing saw and ring gear. Basically, these jumbos consisted of heavy structural-steel framework, mounted on wide-gage railroad wheels. Two heavy-duty Ingersoll-Rand air tuggers helped control the forward crowding movement of the jumbo. Another air tugger raised or lowered a full-width drilling platform, on which drillers could work while the saw made its cut.

The Goodman saw was so mounted that the 75-hp motor drove it through a gear train. The saw was driven around the ring-gear circle by a 10-hp Gardner-Denver air motor. Saw direction—the ability to tilt the saw point to correct for deviation in alignment—was achieved through a manual control. This permitted the tunnel walls to be excavated to close tolerance, so far as diameter and line were concerned.

The shop-manufacturing of the jumbos and the saw mounts was done entirely in the field, at the machine shop Mason maintained for the routine repair of equipment. When the final lubrication bugs were whipped, the machine performed exactly as planned.

How It Worked

A typical 8-foot tunnel excavation round began with the saw and its mounting. Wide-gage railroad rails, carried on welded cleats and timbers on the 8-inch and 10-inch H-beam ring reinforcing, carried the jumbo. The machine transferred from its standby track outside the tunnels, and either pulled itself up to the face by its air tuggers, or was pushed in by a small Allis-Chalmers HD-5 tractor and its Gar Wood dozer blade.

Drillers with five Ingersoll-Rand J-40 Jackhamers first worked from the tunnel floor, drilling 2-inch holes 8 feet deep into the lower part of the face. Left-hand steel, spiraled to remove the cuttings, was used, with flat cutting edges. The hole pattern for the small-diameter tunnels consisted usually of 35 equally spaced holes in parallel rows, while 42 to 45 holes were in the larger tunnels.

When the lower holes accessible from the floor were drilled, the Goodman saw "sumped in" just below the 2-foot unsawed plug left in below the spring line on either side to support the round. After about 2 feet of saw travel, the blade was stopped long enough to let a man slip hardwood blocking in the 6-inch saw cut. This blocking, and the retention of a 2-foot unsawed plug below each spring line, was standard procedure. The chalk was not strong enough, as a rule, to support its own weight.

If the plug had not been blown off clean, the saw trimmed it to neat lines before sumping in. A cut was then made across the bottom part of the circle to the plug on the opposite side. The saw was then pulled and the previous plug trimmed.

Sumping in again so as to leave a 2-foot plug here, the saw began cutting in a clockwise pattern around the upper part of the circle. Ordinarily it took from 30 to 40 minutes to make the saw cut, so this gave the 5 drillers time to sink the upper holes, as they worked off the jumbo platform.

The presence of iron pyrite and quartz in some of the chalk formation made things tough on saw teeth, but extra hard-faced teeth were always on hand in case one or more needed replacement.

When the saw cut and the drill holes were finished, the machine moved out to the standby track, and transferred to another tunnel to go to work on another heading. By working at least two and sometimes three headings, the machines were, for most practical purposes, continuously busy.

The H-beam rings which braced the tunnel on 4-foot centers were next erected with a truck-mounted steel-erection jumbo. Rings were assembled outside the tunnel. The bottom quarter was placed; then the top three quadrants in one piece were brought in on this jumbo, erected, bolted, wedged, and steel angle space bars set in.

The drilled holes were now loaded from the steel-setting jumbo. Hercules

(*Concluded on next page*)

Hercomite 3X powder in sticks was used throughout. The blasting technique was somewhat unusual in tunnel excavation, for there were nothing but lifter charges. The upper row was loaded lightly, increasing the charge toward the bottom. Heaviest charges went in the bottom row of holes, but even so, the average explosive ratio was only 0.6 pound of powder per cubic yard of in-place excavation.

Delays from zero to No. 7 were placed, setting the charge to go off first at the top. The last heavy bottom charge to go gave the spoil pile a heavy shake, and resulted in a well broken rock pile. Shots were detonated by a 440-volt firing line. Absolute firing was insured by using a ring trunk line which connected to one wire of each exploder.

The excavation round was then completed by a Conway Type 100 tunnel mucker, which loaded from 3 to 5 Euclid end-dump trucks. To assist the Conway mucker crowd into the rock pile, a special 2-position drawbar was used between the truck and mucker. With the stiff bar in No. 1 position, the mucker loaded the first half of the bed as the truck backed up to help crowd the shovel into the blasted rock. A man then pulled a pin which allowed the bar to telescope back to No. 2 position, and the process was repeated until the truck had its load. It then unhooked and drove on out. Mucking progress was often as high as 80 in-place yards an hour, due largely to this simple contrivance.

Round-the-clock operations were the rule, and they resulted in two 8-foot rounds a day in each large-diameter heading or three rounds in the small-diameter heading. The best footage was 311 in one week, and that was in the large-diameter tunnel.

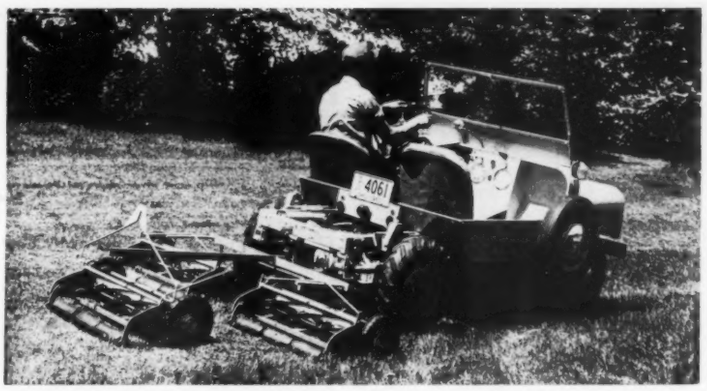
Dangerous, blocky chalk was a constant nightmare to every shifter, every superintendent, and every miner. Water seepage along slickensided planes of weakness was the worst condition, for occasionally it weakened a blocky place and let it fall in, either from the sides, the roof, or the face. A cantilevered safety grille, made of heavy structural steel and covered by 2-inch wire mesh, stayed overhead above the jumbos when they worked. Beyond all doubt its use prevented a number of serious accidents.

Unluckily, it did not prevent them all. Three fatalities and some lost-limb accidents had marred the job when CONTRACTORS AND ENGINEERS MONTHLY visited it. The day after this piece was written, a bad cave-in from a treacherous face added another name to the list of men who gave their lives that a dam might be built . . . and three other men were hurt in the same accident.

But the somber note of unfortunate accidents detracts not at all from the first successful rock-sawing performance in tunnel construction.

Dual-Use Vehicle For Roadside Work

A new dual-purpose vehicle, originally designed for the farm field, but also applicable for highway-department roadside work, has been developed by Crosley Motors, Inc., 2530 Spring Grove Ave., Cincinnati 14, Ohio. This lightweight motor vehicle has a 26.5-hp engine and a 36-inch wheelbase. It is designed to do the work of a light tractor and also provide transportation for personnel.



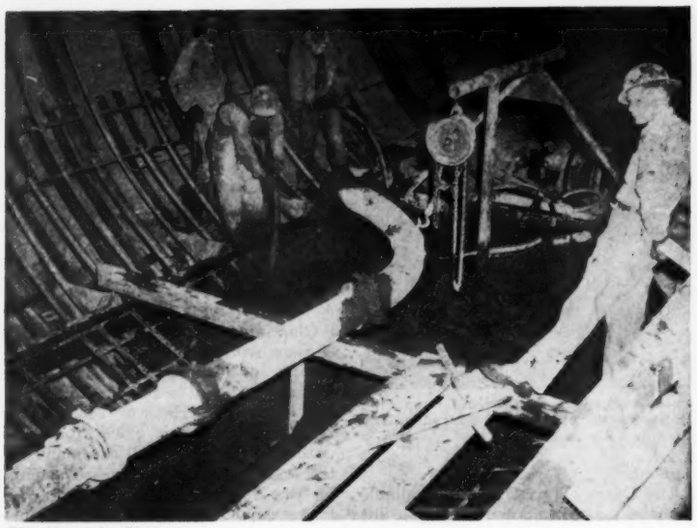
From farm—for which it was originally designed—to roadside is a natural jump for Crosley's FarmOroad, which serves as a light tractor for towing mowers and other implements. It may also be fitted as a 4-man carrier.

The Crosley FarmOroad is available with power takeoff and hydraulic lift on front, rear, or both. Implements including reel or sickle-bar mowers, cultivators, and hydraulic-powered dump bodies are available for it. The FarmOroad may also be equipped with dual rear wheels for heavy pulling. The basic vehicle is supplied with a heavy-duty rear axle and transmission, giving 6 speeds forward and 2 reverse. The vehicle may be fitted as a 4-man carrier.

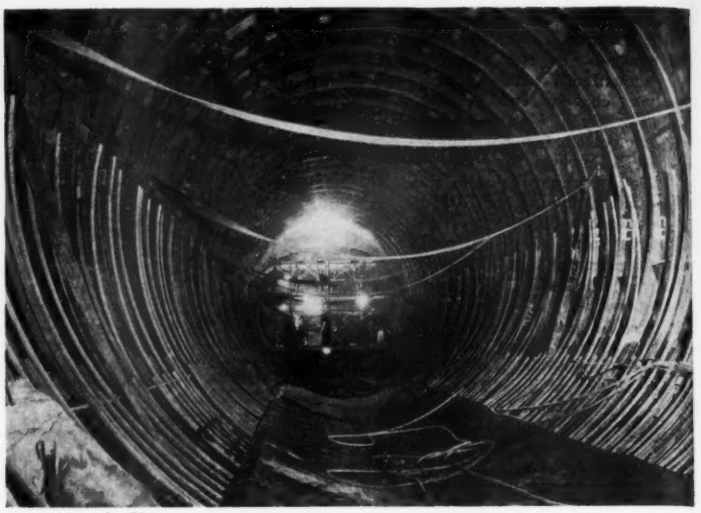
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 491.

Gurley Old-Timer Dies

Clermont C. Covert, associated for 28 years with W. & L. E. Gurley, manufacturer of surveying and engineering instruments, died in Binghamton, N. Y., last December. He was Manager of Gurley's New York office from 1926 until its closing in 1948. Especially interested in stream-flow measurements, he was responsible for a number of improvements in the Price pattern current meter as well as graphic water-level recorders.



Silas Mason Co. Photo
Pumpcrete lines and a CP air vibrator deliver and consolidate tunnel-lining concrete.



Silas Mason Co. Photo
The tunnel invert has been placed and Vacuum-Processed, and rubber water stops hang suspended for the wall pours.

Lining the Tunnels At Fort Randall Dam

(*Continued from page 45*)

steel—1,930,000 pounds of it in 2-inch square bars—went into only 92,500 cubic yards of concrete.

Invert Cleanup Starts

The first operation for the start of a monolith was cleanup activity to start the invert. The invert pour, made ahead of the remainder of the section, placed concrete in the bottom 60 degrees of the tunnel circle.

Since a great deal of loose rock, dirt, and debris remained behind tunnel excavation, the primary cleanup was a man-sized job. A labor crew shoveled the material to a small electric-driven Barber - Greene stacker - conveyor, which dropped it into dump trucks. The crew worked from the far end toward the downstream portal so the conveyor and truck would always be on good footing.

When the worst of the debris was out, the portion of the 8-inch steel H-beam rings inside the pour was cleaned by electric-powered and air-driven brushes. When the steel was perfectly clean, reinforcing steel for the lower part was set by the steel gang.

While the tunnel outline was nearly perfect because it had been sawed, the final cleanup was never easy. An air jet first blew out all visible dirt and debris. The two bulkheads were then set and further cleanup moved remaining material down to a small sump left in the invert rock. Loose material as fine as dust was picked up before the pour by industrial vacuum cleaners.

The invert pours were pumped in from the batch plant by two Rex 200 double Pumpcrete machines. Alternate monoliths were poured, and the intermediate monoliths poured on the succeeding pouring operation. In the summer, concrete temperature had to be within 50 and 65 degrees, and the closer to 50 degrees it was, the better. During cold-weather operation the tunnel had to be heated by hot air, and concrete temperatures also had to be at least 50 degrees.

As the invert pours were screeded off and finished, the Vacuum Process was applied. Sheet-iron mats 3 x 4 feet, made of 18-gage metal, were used. On the under side was the usual rubber suction seal and fly screen and muslin which insured that only water would be removed. The suction manifold was hooked to a 315-foot electric-driven vacuum pump, and two water tanks in series. The 315-foot machine developed and held from 20 to 23 inches of vacuum when 12 mats were in use. After the patented process had been applied for about 30 minutes, the mats were

(*Continued on next page*)

removed and the concrete surface was finished off by steel trowels.

Joint Sandblasting Follows

After the concrete had set up, the construction joint at each side of the invert was cleaned down to bare aggregate by wet sandblasting. At the same time, steel reinforcement splashed with concrete was also cleaned.

Seven days after completion of the invert pouring in each tunnel, cross ties were laid on the invert with two sets of track, 36-inch gage for haulage and 10 feet 0 inches for forms.

Ring and longitudinal steel bars were now set in the rest of the pour from a small steel tower jumbo. The heavy rubber water stop at each construction joint, now partly embedded in the invert slab, was straightened to fit the rest of the circle. Wood and steel bulkheads and forms were then brought in on the railroad track after a preliminary air-water-sand cleanup. The steel reinforcement and tunnel bracing were also cleaned.

Form Setting

Three sets of Blaw-Knox collapsible steel traveling forms were on hand to make the 28-foot-diameter pours, while four sets were available for the smaller-diameter tunnels. The steel forms were so simple, strong, and foolproof that setups in 1½ hours were not uncommon.

The center line of form and the center line of tunnel had been established. As the form arrived in position by a pull from an air tugger, men went to work. Four Blackhawk hydraulic jacks at each corner of the 24-foot form moved the top up toward the tunnel top. When a steel tape showed the proper diameter distance from the previous invert to the top of the form, the right grade had been reached.

Heavy steel ratchets on each side of the upright carrier legs now moved the hinged lower parts of the form out toward the wall lines. The exact location of wall lines was referenced in to a convenient piece of tunnel bracing steel. The foreman used a rule marked in tenths and hundredths of a foot, and in a short time the ratchets had the sides in position.

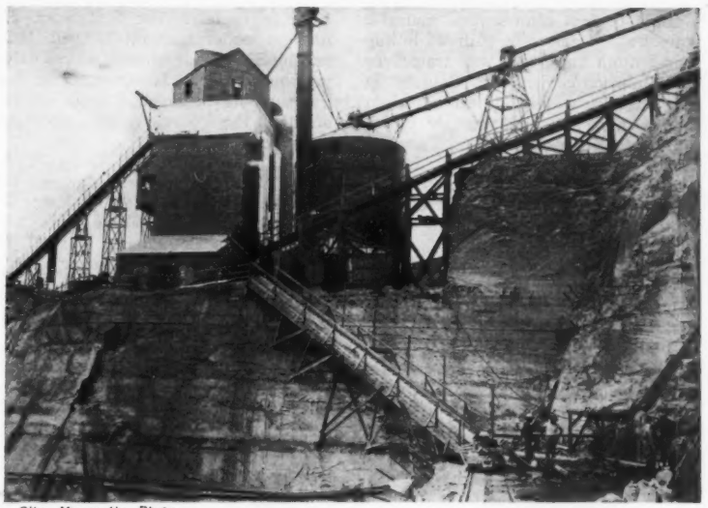
Large cones, welded to the invert reinforcement steel before the invert pour, were available to hold down the bottom of the hinged form. One-inch steel bolts at close intervals were placed through the form wales down to these cones, and tightened so the entire load was equalized on each bolt.

Other safety bracing was now put in; and it paid off at least once when one of the 1-inch bolts snapped under a load and let a corner start up. Steel spreaders were tightened between the main legs of the carrier. Heavy 6 x 12 Douglas fir timbers, wedged in tightly, were also placed. Other timbers were inserted and wedged between the invert slab and the carrier frame to help counteract uplift pressure.

Timber and steel were used in the bulkhead. The bulkhead had to be fitted around reinforcing steel and a rubber water stop. It was one of the most difficult and time-consuming portions of forming.

They had trouble initially, too, with forms sticking to concrete. Ordinary form oil and even paraffin would fail when the discharge from Pumpcrete slickpipe scoured over it. Finally a new Socony-Vacuum product called Ceremul M, a micro-crystalline wax emulsion, was brought in. It could be sprayed on as heavy as they wanted, and the wax would not chip.

After the form was in place and tied down, cleanup crews again worked for several hours with water jets, brushes, and industrial vacuum cleaners to remove everything but clean and solid material. Surveyors checked the final location to a tolerance of ½ inch of line and grade, and usually the form checked both ways to less than ¼ inch.



Silas Mason Co. Photo

Silas Mason's fully-automatic Johnson batch plant made use of the Hightower cooling system in hot weather to hold concrete temperature to within 50 to 65 degrees.

Pumpcrete Makes Pour

Each pour was made by Rex Pumpcrete machines. Three No. 200 double units were available. One was set up at the batch plant to deliver concrete to the tunnels. One was set up at the form, and one was available if needed as a relay.

Three main lines were laid away from the machine near the form. The outer two lines delivered concrete through other pipes to the sidewalls of the pour. A Siamese connection at the Pumpcrete machine permitted it to send concrete through the center pipeline to finish out the top of the pour, either by slickpiping, or by pumping straight up through three ceiling connections on the closure pours.

The machine began operations by dumping simultaneously through three low trapdoors on each side of the form. As the concrete went in, two men on each side with CP air vibrators

(Concluded on next page)

Lining the Tunnels At Fort Randall Dam

(Continued from preceding page)

crawled around in the maze of steel and vibrated the mix. When the level of the trapdoors had been reached, they were closed and bolted. The Pumpcrete pipe was then connected to two new delivery lines leading to six more trapdoors at higher level. The pour resumed.

Pours were topped out by slickpiping in 5-foot increments. This top concrete went in at a somewhat higher slump than the lower portion. From 4½ to 6-inch-slump concrete in the top was not unusual. This insured a solid distribution of concrete over the top portion, and test holes drilled later in many parts of the tunnel showed that many of the grout pipes that were also placed would not be used. There were few voids between the top of concrete and the rock line.

Rates of pour were high. One foreman placed 189 cubic yards one night on the swing shift in 4½ hours. In general, form setting and cleanup was a daytime job, while concrete placement was reserved for the swing and graveyard shifts.

The forms stayed in for at least 12 hours before they were stripped. The small-diameter forms remained in place usually 16 hours. They were stripped by reversing the setup process, and the carrier was then moved ahead to the next pour. Sprinkler men with hoses kept the green concrete under continuous water cure for 14 days. A stream of spent water was picked up in a sump near the east tunnel portals, and removed by small Ingersoll-Rand air pumps.

The Cooling Plant

Concrete temperatures were controlled in summer by special refrigerating equipment. This consisted of the Hightower refrigerating process which cools aggregates under a cold-air blast. Further reduction of temperature was made by chilling the mixing water to near freezing, and using ice in the mix.

Four G-E compressors in the cold room developed about 125 tons of refrigerating capacity. Freon F12 (dichlorodifluoromethane) was the refrigerant. Iced air was manufactured by drawing a stream of air through refrigerated coils with a high-pressure fan. The cold air then passed through ducts to the coarse-aggregate bin, where it was forced up through the aggregate, collected at the top, and recirculated through the cooling coils.

In the same cold room was an 11-foot-square cold-water supply tank. Chilled by coils inside the tank, the water was drawn up as needed to the two Koehring 2-yard mixers in the plant. Two Vilter 30-ton ice machines produced the fine ice for the mix. It was stored temporarily in a chilled bin; then fed to the batch by a screw feed conveyor.

Where long Pumpcrete lines were used, the concrete temperature had to be as low as 34 degrees when it left the plant to counteract the friction temperature buildup. During the cold weather, the aggregates and water were heated by hot air circulated in the same manner as the cold air, and the concrete lines were insulated. The tunnel was also covered and heated.

Aggregates and sand were supplied by the Corps of Engineers, in hopper-bottom railroad cars delivered at the batch-plant site. The cars were unloaded by gravity to feeder hoppers at track level. A Pioneer stacker-conveyor moved the materials to the proper pile. A 1,200-foot recovery tunnel under the pile permitted the material to come down through feeder gates, and a system of Pioneer conveyor runs delivered it as needed to the big Johnson full-automatic batch plant.

Bulk cement from several manufacturers also came in by railroad in hopper-bottom cars, and was transferred to a Johnson cement silo. Cement, aggregates, ice water, and air-entraining admix were batched together by the automatic Johnson batcher.

The 2-yard dry batches dropped with chilled water to the Koehring mixers, which discharged the concrete to the feeder hopper on the first Pumpcrete machine.

So abrasive was the aggregate that mixer and Pumpcrete liners wore rapidly. Every Sunday was set aside for the replacement of liners. Occasionally the abrasive mix wore out a set of liners in only 600 cubic yards; seldom did they last more than 2,000 yards.

All in all, the Fort Randall tunnels went in rapidly. The first work did not get under way until April, 1949, and by September of 1950, tunnel driving was complete. It was expected that lining would be finished some months ahead of the February, 1951, deadline.

Personnel

R. B. Jewell, Resident Manager for Silas Mason Co., headed the contractor's organization. George Lyle was General Superintendent, and J. C. Drummond was the contractor's Resident Engineer.

Colonel Henry J. Hoeffer is District Engineer, Omaha District. G. O. Evans, Area Engineer, headed the Corps of Engineers staff under whose direction the big dam is being built.

Fort Randall Dam, when completed, will hold a reservoir of 6,200,000 acre-feet behind a 10,000-foot 28,000,000-cubic-yard earth embankment 160 feet high. It will be the downstream main reservoir on the Missouri main stem. According to the Corps of Engineers, its $165,000,000 cost will be justified because of flood-control, power, navigation, and recreation benefits to the public at large.

Power-Sweeper Co. Moves

The Wilshire Power Sweeper Co. has moved its offices and plant from 4615 Alger St., Los Angeles, to 526 W. Chevy Chase Drive, Glendale, Calif. Increasing demand for power sweepers necessitated the move to the new plant, consisting of 29,000 square feet.

An Automatic Nailer

A new magnetic-feed hand-driven automatic nailer has been announced by the Holt Mfg. Co., 651 20th St., Oakland 12, Calif. Flat-head common nails or brads, loaded in the hopper, are quickly and automatically delivered in perfect alignment, so that every mallet blow drives a nail, the company says.

The Holt automatic nailer can be used for plywood subflooring, top nail strip flooring, veneers, tileboard, and other wallboards. Metalworkers can use it for nailing sheet and light metal to frames, the company states. It is built for heavy-duty wear, with all working parts enclosed. Simple adjustments switch from flush to set nailing, and from common nails to floor brads. The

The new Holt automatic nailer is magnetic-fed and hand-driven, and built for heavy duty.

Holt automatic nailer comes complete with bushing accessories for brads and nails, a replaceable-head mallet, and a handy carrying box.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 467.

Lincoln Personnel

James William Brooks has assumed sales and engineering responsibilities for The Lincoln Electric Co. in its Indianapolis district, after being transferred from the Boston district. Thomas L. Dempsey has come to the Cleveland sales staff as a special field engineer, and John F. Kotchian, welding engineer, now serves the company's industrial accounts in the Chicago district. He was formerly with the Cleveland office.

The Schramm Model 600 compressor delivers 600 cfm and has skid or four-wheel spring mounting.

Portable Compressor In the 600-CFM Class

A new heavy-duty compressor designed to deliver 600 cfm of air has been developed by Schramm, Inc., West Chester, Pa. It is powered by a 6-cylinder International Harvester Model UD-24 diesel engine; compressor and engine operate at 1,200 rpm.

The Schramm Model 600 is available for skid or 4-wheel spring mounting. It is recommended by the manufacturer for operating two large-sized wagon drills, six heavy-duty rotating drills, large cement guns, and sand-blasting outfits for major engineering projects. Features of the unit include simplified design, water cooling, dual fan belts, and Pneumastat control.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 535.

New Unwatering System

Contractors engaged in tunneling and other excavation work will be interested in a new system for unwatering excavations developed by Pacific Pumping Co., 9201 San Leandro St., Oakland, Calif.

The method, on which patents are pending, calls for a centrifugal pump, a tank, and a pipe which supplies water at high pressure to a series of ejectors from which sand points are located where needed. The water discharged from the ejectors supplies a tank connected to the pump suction, the excess water being disposed of either by gravity or, if the location of the pump makes this impossible, by use of a booster pump.

The system features a saving in first cost, says Pacific, due to the use of a centrifugal pump instead of vacuum equipment; moreover the centrifugal pump can be located at any convenient point on the job site. The header pipe, once placed in position, need not be moved during the progress of the job; the multiple sand points with ejectors can be used at almost any depth below ground and at a considerable distance from the pump; if the water level drops so that even a majority of the sand points are sucking air, the performance of those still submerged in water is not affected. These features, the company says, enable use of the system without continued supervision.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 434.

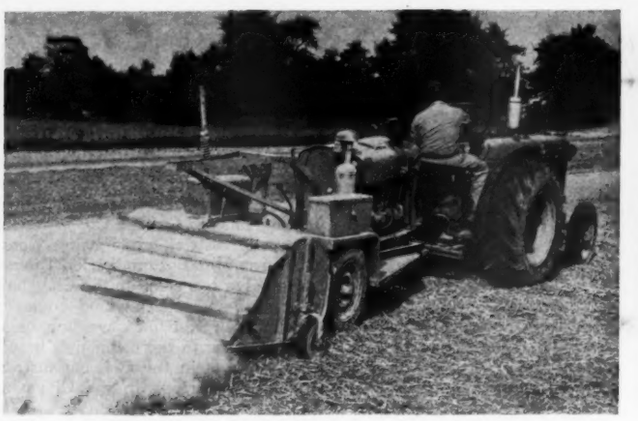
Mobile Water Coolers

A circular describing a line of mobile water coolers with filters and dechlorinators has been prepared by Filtrine Mfg. Co., 53 Lexington Ave., Brooklyn 5, N. Y. The coolers are made with water-reservoir capacities of 7 to 25 gallons and may be used to supply up to 500 men. They are designed for all-weather operations.

The filtrine coolers permit efficient operation by electric or gasoline-engine power, with air or water-cooled refrigeration machines. The unit is fitted with corrosion-resistant exterior and interior parts. Its other construction features are described in Form 948.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 444.

Instead of requiring straw mulch tied down by peg and twine on contract seeding . . .



Ohio now permits the straw to be tacked down by a power-driven rotary type of mixing machine (her own forces have used this method on berms for the past five years) . . .

Or mulching with asphalt emulsion or cutback at 0.2 gallon per square yard.

Ohio Uses Asphalt Mulch for Seeding

The Ohio Department of Highways has adopted a supplemental specification authorizing the use of asphalt mulch on all contract seeding. The new specification gives the contractor four optional methods of mulching all seeded areas on new construction; first, the regular method of mulch with straw held in place by twine and pegs; second, tacking the straw mulch down with a power-driven rotary type of mixing machine; third, the use of an asphalt emulsion applied over the surface of the seeded area at 0.2 gallon per square yard; fourth, using an asphalt cutback at 0.2 gallon per square yard.

Ohio found holding the straw mulch in place by twine and pegs uneconomical because of its dependence on hand labor. Maintenance forces of the Highway Department have used the power-driven rotary-type mixing machine for the past five years in the reseeding of berms, and it was specified for use on several construction contracts. Results were so satisfactory that during the past year it became an optional method on all new construction, with a very definite drop in the cost of seeding and mulching operations.

Now, with the adoption of the new supplemental specifications, two other options are offered the contractor—two types of bituminous mulch. Several projects have been mulched this way on Ohio highways in the past three years with satisfactory results.

This year, through September 12, the Ohio Department of Highways has awarded contracts for new construction which included 7,946,003 square yards of seeding.

Roadside-Development Papers Are Assembled

The Highway Research Board has made available in booklet form the reports of the Committee on Roadside Development which were presented at the 29th Annual Meeting of the HRB in 1949. The reports and special papers deal with shoulders, roadside grading and drainage design, right-of-ways, parking turnouts and wayside areas, and roadside equipment. The 110-page book includes plenty of pictures and diagrams.

To secure a copy, write to the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C., and enclose $1.50.

Use of the Altimeter For Preliminary Surveys

A 12-page booklet describing preliminary survey procedures with an altimeter has been prepared by the Educational Division of American Paulin System, 1847 S. Flower St., Los Angeles 15, Calif. The author of this work, Raymond A. Hill, member of the American Society of Civil Engineers, explains in detail the practical use of the American Paulin System altimeter in connection with all branches of preliminary field surveying. He points out the advantages in speed and economy of barometric level in reconnaissance, topographic, and other surveys. The exact procedure to be used in the field is fully outlined in this article.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 446.

New Utility Trucks For Repair Servicing

Four new service-utility trucks for building and construction service and repair have been announced by the Motor Truck Division of International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

The trucks feature Aristocrat "troubleshooter" bodies, factory-mounted, exclusively designed for L-110, L-120, L-130, or L-150 International chassis. The Aristocrat body is of electrically welded, all-steel construction. The body floor is of one-piece ribbed steel and is provided with drains.

Weathertight vertical and horizontal compartments on left and right sides, recessed door handles, slam-action catches, and cylinder locks which are keyed alike are features of the body. Parts bins are provided in horizontal compartments on either side of the body. Bins on the left side have removable dividers. Tool and material trays are built in, and all compartment shelves and partitions have safety rolled edges.

Aristocrat all-steel electrically welded bodies feature the new International Harvester service-utility trucks for building and construction service and repair.

Body Model A-77 for 115-inch wheelbase International L-110 and L-120 trucks measures 77 inches at the floor line. Inside width of the body is 48½ inches; outside width is 75 inches. Body height is 42 inches, while the height of the body above the floor line is 29 inches. Width of the vertical compartments is 18½ inches.

Body Model A-89 is designed for 127-inch-wheelbase models of the International L-110 and L-120 series. Floor-line measurement is 89 inches. Other measurements: inside width of body, 48½ inches; outside width, 75 inches; body height, 42 inches; body height above the floor line, 29 inches; width of vertical compartments, 18½ inches.

Body Model A-96 is designed for International L-130 series, 134-inch wheelbase, and L-150 series, 130-inch wheelbase, both with single rear wheels. Floor-line measurement is 89 inches. Other measurements: inside width of body, 48½ inches; outside width of body, 75 inches; height of body, 42 inches; height of body above floor line, 29 inches.

Optional equipment, by which the vehicles can be adapted to individual uses, includes a free-sliding, telescopic-type steel roof and inverted end gate with locking handle; overhead ladder rack with tool and material brackets; removable vise bracket; pipe support mounted on right side of head panel; heavy-duty rear bumper and safety-tread step; and side-mounted pipe-carrying brackets.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 469.

A Water-Repellent

A new colorless, liquid, water-repellent, Silaseal, is produced by the Surface Protection Co., 16799 Euclid Ave., Cleveland 12, Ohio. The company claims that absorbent masonry walls treated with Silaseal will repel rain and moisture, and that dirt and grime will not adhere to areas treated. The colorless liquid is said to preserve the natural beauty of masonry surfaces. A feature of this silicone product is that it permits normal "breathing" of the masonry wall. Air is free to pass through to the coated pores, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 492.

Data on Foundation Pipes

An 8-page illustrated bulletin on Armco foundation pipe for pipe piles, pile shells, and caissons has been put out by Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, Middletown, Ohio. Armco foundation pipe is a spirally wound and welded tube made on automatic machines from specially prepared coil or skelp-plate. It is available in standard sizes from 6 to 36 inches in diameter. The literature points out six features of the pipe and includes a chart of dimensions and properties.

The folder indicates various mill services that are offered to the contractor. It stresses field features of the pipe: no special driving equipment, no top reinforcement, cutoffs economically salvaged, and ease and speed of inspection. Armco foundation pipes may be used as end bearing piles, friction piles, compactor piles, batter piles, caissons, and underpinning.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 461.

Latest Shunk Appointments

Raymond F. Allen is now General Manager of the Shunk Mfg. Co., Bucyrus, Ohio—manufacturer of blades for all types of earth-moving equipment.

Clayton B. Humphrey is Eastern Sales Representative covering the New England states, New York, Pennsylvania, east-coast states, Virginia, West Virginia, and the eastern part of Canada including Toronto. His headquarters are in Schenectady, N. Y.

J. W. Tufford is the Northwestern District Sales Representative, with headquarters in Minneapolis. He will cover Wisconsin, Minnesota, North and South Dakota, Iowa, and Nebraska.

New Concrete Runway For Michigan Airport

Wayne County Lays 11-Inch Pavement, 7,900 x 200 Feet, On 9-Inch Sand Cushion; Improved Field Within Easy Access Of Downtown Detroit

By WILLIAM H. QUIRK,
Eastern Editor

• A NEW concrete runway has been added to the Detroit Wayne Major Airport as part of the $14,000,000 improvement program now under way at the big field southwest of Detroit, Mich. The 7,900 x 200-foot strip is the fourth runway of the ultimate six-runway open-parallel pattern laid out in three directions.

Located just off the Detroit Industrial Expressway, Detroit Wayne Major Airport is about 16 miles from downtown Detroit, the country's fifth-largest city. When the John C. Lodge and Edsel Ford Expressways, now under construction in the motor capital, are completed, driving time to the airport from the heart of the city should take no longer than 20 minutes. Over the same route, Willow Run Airport is considerably farther.

Detroit Wayne Major Airport came into being in 1929-1930 on a 600-acre site west of the intersection of Middle Belt and Goddard Roads in Romulus Township. Since then its area has been expanded to 2,300 acres containing three concrete runways all 200 feet wide, laid out to form a triangle. The east-west runway at the base of the triangle is 7,600 feet long; a 7,100-foot runway forms the northeast-southwest side; while on the opposite side is a 5,900-foot northwest-southeast runway. The new 7,900-foot runway is west of the original layout, and parallels the northeast-southwest strip; it will be equipped with the finest instrument landing aids.

Two additional runways will be constructed under the expansion program, scheduled for completion in 1952. A control tower and the first stages of terminal and cargo buildings will be built in 1951. At present the field is used by the Michigan Air National Guard, air freight traffic, private flying, and several nonscheduled passenger airlines. Detroit Wayne Major Airport was also the scene of the 1950 National Air Show.

Grading and Drainage

Before any work began on the paving, the site for the new runway was graded and drained. Wayne County awarded an $83,854 contract to Louis Gavaglia of Centerline, Mich., for grading the area, and a $197,443 contract to Joseph Plozai, Inc., of Detroit, for draining the site. These two jobs got under way in December, 1949, and the grading continued for a month before winter weather put a halt to earth-moving operations until the following April. Work on the drainage continued through the winter.

Major item in the grading was 231,791 cubic yards of unclassified excavation which was moved with a fleet of six tractor-scraper units and three Tournapulls. The terrain was gently rolling with a slight slope from west to east. The soil was chiefly clay, marked by a scattering of sand knolls not over 2 feet in thickness. Compaction to 95 per cent modified Proctor was obtained with a Cedarapids 30-ton rubber-tire compactor pulled by a Caterpillar D8 tractor, after lighter rubber-tired rollers, sheepsfoot rollers, and loaded scrapers failed to produce the required results.

Included in the drainage contract were 3,000 linear feet of 66-inch rein-

(Continued on next page)

C. & E. M. Photo
Frank G. Loselle (left) was Superintendent on the airport contract, and John D. Benjamin, Project Engineer.

forced-concrete pipe; 28,000 feet of RC pipe, 12 to 60-inch diameter; and 90 manholes, inlets, or catch basins. Catch basins are spotted in lines of 150 feet off each edge of the runway, and approximately 300 feet on centers. They are hooked up with a pipe system that drains all storm water off to the eastern end of the field where ditches carry it beyond the limits of the airport. Along the easterly limits of the tract there is a 168-acre drainage storage pond where water may be impounded to a depth of 3 feet. This facility is useful during the rainy spring season when the outlet ditches are taxed to capacity.

Paving Contract

Contract for paving the new runway went to the Loselle Construction Co. of Wyandotte, Mich., on its low bid of $770,000. The preliminary contracts were sufficiently advanced to permit paving to start on August 8, and by November the concrete was all in place. Besides the paving, this contract included cross tile, edge drains, and granular-subbase items. The 6-inch edge or underdrain is laid in parallel rows 204 feet apart, or 2 feet off each edge of pavement; the rows are connected at frequent intervals by 12-inch cross tile. The 9-inch granular subbase course, a single layer of sand, is a foundation for the pavement and also extends out to the edge of the drains. It was compacted by the leveling and spreading equipment to 95 per cent of modified Proctor.

The 200-foot-wide runway has a crown at the center with a 1 per cent grade to the edges which is continued out through the shoulders. The 11-inch concrete pavement is reinforced with steel-wire mesh laid 3¾ inches below the surface of the slabs. For the final 10 per cent of length at the ends of the 7,900-foot runway the pavement is thickened to 13 inches, with the mesh reinforcing 4¼ inches below the surface of the concrete.

The pavement is laid in 20-foot lanes with expansion joints at 135-foot intervals. Transverse contraction joints are on 45-foot centers, and every 15 feet there is a transverse dummy or plane-of-weakness joint. Adjoining lanes are keyed together, the keyways formed by bolting metal keyway strips to the concrete forms. Only the outer lane on each side of the runway has tie bars to the adjoining concrete pavement. These ties are ⅝ x 30-inch bars spaced on 30-inch centers along the longitudinal joint.

Batch Plant

Concrete was batched on the site in a plant setup arranged by the contractor to insure an even flow of materials to the paver. Laid out in a row at the north end of the runway were three Butler bins, all electrically operated, and each with dual batching facilities. First came a 75-ton coarse-aggregate bin for the stone, then a 270-barrel cement bin with an adjoining 330-barrel storage silo, followed by a 75-ton fine-aggregate bin for the sand. Batch trucks, holding two batches each, were loaded in that order so as to sandwich the cement between the stone and the sand to keep it from blowing away.

Crushed limestone for the coarse aggregate came from the Dolomite Stone Co. on Drummond Island in Michigan's northern peninsula. It was barged to a dock on the Rouge River at Detroit, and trucked from there to the job. Sand was procured from a local pit at nearby Ypsilanti, and delivered to the airport by truck.

C. & E. M. Photo

Loselle's batch plant for the runway paving at the $14,000,000 airport-improvement project in Detroit—a Butler sand bin at left and cement silo at right.

Air-entrained cement was furnished by both Huron and Peerless Portland Cement Cos. of Detroit, and delivered in bulk to the storage bin after an average 15-mile haul by the George F. Alger Co. and the Hess Cartage Co., both of Detroit. The two truckers hauled a total of 1,500 barrels of cement a day. Alger employed a "train" of two Gramm trailers from which the cement was expelled by compressed air. Hess used a pair of Fruehauf trailers equipped with worm-gear feeds for unloading. The cement was discharged into the conventional hopper, then carried along to the bins by worm gear and enclosed elevator.

From the stockpiles the aggregate was loaded into bins by a Model 6 Northwest crane equipped with a 60-foot boom and a Johnson 1½-yard clamshell bucket. Electric power for operating the batching units was supplied by a General Electric 25-kw light plant. From eight to twelve rented trucks hauled the dry batches from

(Continued on next page)

New Concrete Runway For Michigan Airport

(*Continued from preceding page*)

plant to paver, making a complete loop as they passed under the bins in getting loaded. The maximum haul slightly exceeded 8,000 feet.

Typical Batch

A typical 8-bag batch of concrete contained the following:

Cement	752 lbs.
Sand	1,667 lbs.
Stone	2,790 lbs.
Water	32 gals.

Water for the mix was readily obtainable from mains servicing the airport. It was delivered to the paver in two 1,500-gallon tank trucks.

Paving began with the lane immediately east of the center line of the runway, and proceeded from the northeast to the southwest end of the strip. Then the lane to the west was paved, followed by the paver looping the job going down one side and up the other

A Cleveland form tamper packs the sand under Metaforms to solid footing for runway paving at the Detroit Wayne Major Airport.

in 20-foot lanes until the edges were reached. After the concrete had cured for 14 days, the paver and batch trucks were permitted to operate off the new pavement. An average of 1,400 feet of concrete, 20 feet wide, was laid in a 10-hour day.

Paving Operations

A total of 3,000 linear feet of Metaforms were available for the paving. Pins were driven by hand, and a Cleveland form tamper packed the sand beneath to a solid footing. An R-B Finegrader threw off any excess sand from the cushion, cutting the grade to precise cross sections. Since the paver worked outside the forms, the joints were installed well in advance of the concreting.

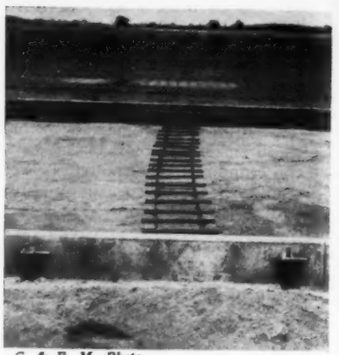
Basket assemblies for both expansion and contraction joints were furnished by the Universal Form Clamp Co. of Chicago, while the dowel bars came from the Calumet Steel Division of Borg-Warner, Inc., also of Chicago. The 1-inch-thick premolded material in the expansion joints was supplied by W. R. Meadows Co. of Elgin, Ill. Joints were left one inch low, the open slots being filled in after the paving. Both joints have plain dowels on 10-inch centers across the lane; in the expansion joints the dowels are 1 x 20-inch, while in the contraction joints they are 1 x 18-inch.

Batches were mixed one minute in a Ransome 34-E dual-drum paver equipped with a 41-foot boom, then dumped on the grade in front of a Blaw-Knox paddle-type spreader. On each side at the rear of the spreader was a Jackson vibrator to vibrate the concrete along the forms. The spreader struck off the concrete to the depth of the wire mesh, which was supplied by the Laclede Steel Co. of St. Louis. After going ahead the distance between two contraction joints, 45 feet, the paver and spreader moved back while the steel reinforcing was placed on the first lift of concrete. More concrete was then added, and spread over the mesh to fill the forms.

Finishing the Surface

Behind the spreader came a Jaeger-Lakewood dual-screed finishing machine, followed by a Heltzel Flex-Plane. Off the latter unit, premolded strips were inserted into the surface of the concrete at the transverse contraction and dummy joints, and at the longitudinal dummy joints running down the center line of each 20-foot lane. These strips are all 2¾ inches deep x ¼ inch wide.

Hand finishers then straightedged and floated the surface of the concrete, covering over all but the expansion joints. Edging along the forms and at the expansion joints was done with a ¼-inch-radius tool. The concrete was cured with a membrane compound supplied by the Alpine Co. of Chicago, and sprayed on from a Heltzel Flex-Plane machine bringing up the rear. After the forms were removed, the sides of the slab were also sprayed with the curing compound applied by a Chausse spray unit.



C. & E. M. Photo

Transverse contraction joints are on 45-foot centers in the new runway. Universal Form Clamp Co. furnished the basket assemblies.

The slot at the top of the expansion joints, and the crack running longitudinally between the adjacent lanes of

(*Concluded on next page*)

concrete were filled in later with Flint-Kote. This rubber filler was heated to 400 degrees F in a Sealz Melter.

Quantities and Personnel

The major items in the runway-paving contract included the following:

12-inch cross tile	1,440 lin. ft.
6-inch edge drain	15,076 lin. ft.
Granular subbase	44,062 cu. yds.
11-inch RC pavement	135,465 sq. yds.
13-inch RC pavement	35,670 sq. yds.

The Loselle Construction Co. employed an average force of 80 men on the project under the direction of Frank G. Loselle, Superintendent.

Cleans Air Supply For Pneumatic Tools

A complete line of separators for cleaning compressed air by means of centrifugal force is announced by the Swartwout Co., 18511 Euclid Ave., Cleveland 12, Ohio. The Swartwout Airfuge is available in seven inlet and outlet tapping sizes, from ½ to 2½ inches.

According to the manufacturer, the separator removes 99 per cent or more of all impurities from compressed air without pressure drop. Moisture, oil, scale, and other solids in the air are whirled outward to the walls of the unit where they drain down to the trap section. At the same time the clean, dry air passes unimpeded to feed the line or tool, operating the equipment without danger of the corrosion, wear, clogging, fire, explosion, or freezing which occur with contaminated air, the manufacturer reports.

A float-operated trap automatically releases accumulated liquids as they rise to a level above that necessary to effect a seal. The drain valve outlet is tapered to prevent stoppage by particles of scale, etc.

Further information may be secured from the company by requesting Bulletin S-13. Or use the Request Card at page 16. Circle No. 442.

Trailer-Truck Unit Carries Bulk Cement

A new truck and utility trailer combination, specially designed for transporting bulk cement, has been developed by Kenworth Motor Truck Corp., 8801 East Marginal Way, Seattle, Wash.

The truck is a Kenworth Model 825,

Kenworth developed this truck and utility trailer combination especially for transporting bulk cement. The gondola-type semitrailer has a 652-cubic-foot capacity.

powered by a Cummins NHB 200-hp diesel, and equipped with a 5-speed Spicer main transmission and a 3-speed auxiliary. Aluminum is used extensively in the frames, hubs, and gear cases to decrease the tare weight. The utility trailers are gondola-type dual-axle semi's with a carrying capacity of 625 cubic feet.

The sharply inclined hoppers are designed for rapid unloading. Kenworth states that the loading time is 20 minutes, and unloading is possible in 20 minutes to one hour. In addition to butterfly valves, the hoppers are also equipped with canvas boots to prevent loss on the highway or while unloading.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 547.

A New Welding Manual

First in the Eutectic National Defense Services Series of free technical handbooks covering recent developments in welding materials and techniques has been announced by Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y. This manual treats all new advances in Eutectic Low-Temperature welding alloys with special reference to applications for defense production and maintenance. In addition to technical data on characteristics, properties, applications, and operational procedures for these alloys and fluxes, the manual contains valuable information on all phases of welding.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 401.

Cleco's new RC-50 paving breaker is light enough to be handled by one man in horizontal or overhead work.

New Paving Breaker

A new lightweight paving breaker has been added to the line of pneumatic tools manufactured by the Cleco Division of Reed Roller Bit Co., 5125 Clinton Drive, Houston 20, Texas. The RC-50 breaker is light enough to be handled by one man in horizontal or overhead work. It is specially designed for brick work, asphalt cutting, and shop maintenance work.

This new 50-pound breaker incorporates the same type of Reed-Cleco valve as that used on the heavier paving breaker, the RC-80. This valve, the manufacturer states, gives full control on both power and return strokes, assuring hard, uniform blows, fast action, minimum recoil, no short-stroking, and low air consumption. Wear-resistant alloys, automatic lubrication, and heavy-duty construction provide long life and low maintenance costs, says Cleco.

Further information may be secured from the company by requesting Bulletin RC-949. Or use the Request Card at page 16. Circle No. 518.

Mobile Radio Units

A variety of radio communication equipment for use in the highway or heavy-construction industries is manufactured by Link Radio Corp., 125 W. 17th St., New York 11, N. Y. This equipment includes both stationary and mobile units—special emergency and all two-way and three-way services.

One of the most adaptable of the company's units is the radio transmitter-receiver type, 2210-M Ed. 2 (SS), a frequency-modulated transmitter, receiver, and vibrator power supply mounted in a single metal case. The unit measures 17 inches long x 8 inches wide x 6 inches high. By combining all functions on a single chassis and utilizing new engineering techniques, the company reports, optimum performance is achieved with small size.

This set can be mounted conveniently in the driver's compartment of a vehicle; the remote-control unit and all long cable runs are eliminated. If desired it may be located in the rear of the vehicle. The battery drain is low so that it is unnecessary to provide special batteries, generators, or wiring, according to the manufacturer. This unit operates in the 150 to 174-mc frequency and has a nominal output of 10 watts. It is furnished complete with all accessories.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 407.

The Cost of Keeping Files

The executive recognizes that filing systems are the memory and nerves of a business organization, be it private or public. What he may not realize is that creating the contents of an average 5-drawer file costs over $4,500 and operating this file for one year costs approximately $200.

Criteria that enable management to measure the cost and performance standards of filing procedures have been outlined in a study issued by Remington Rand Inc., 315 Fourth Ave., New York 10, N. Y. Entitled "A Yardstick of Filing Cost and Efficiency," this handbook presents costs broken down in detail and substantiated by charts and tables. Performance statistics from operating files are summarized, characteristics of equipment reviewed, and simple criteria developed to assist management in appraising its own files and comparing costs with the national average. The handbook includes a complete bibliography and a simple self-evaluating questionnaire by which one can measure filing efficiency against recognized standards and transpose findings into concrete action for improvement.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 437.

In Northwest for Cummins

Charles J. Wilhite has been promoted to Acting Northwest Regional Manager of Cummins Engine Co., Inc., of Columbus, Ind. His headquarters are at 809-810 Security Bldg., Seattle, Wash. Ralph J. Shields has been appointed to Wilhite's previous position as Northwest Regional Service Representative.

No need to twist or spike one leg of a sling chain to shorten it—the ACCO sling-chain adjuster tends to that, and permits an object to be lifted at any angle desired.

Sling-Chain Adjuster

A new device which permits lifting an object at any desired angle has been developed by American Chain & Cable Co., Inc., E. Princess and Thomas Sts., York, Pa. By shifting a sling chain in the pocket wheel of the ACCO sling-chain adjuster, one leg can be made longer and the other shorter. The chain locks and the load cannot shift, the company says.

Unbalanced loads, or loads hard to handle, can be safely transported using this adjustment, which eliminates twisting or spiking a leg of the chain to shorten it. The sling-chain adjuster is made for chain sizes of ½ to ⅞ inch inclusive. It is supplied with heat-treated carbon or alloy-steel sling chains.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 486.

Math Book for Engineers

A mathematics textbook for engineering and science students has been written by Dr. W. R. Van Voorhis and Dr. E. E. Haskins of the School of Engineering of Fenn College, Cleveland. It is entitled "Mathematics for Engineering and Science Students" and it integrates topics usually included in courses in algebra, trigonometry, and analytical geometry, with emphais on the needs of engineering and science students. It follows the recommendations of the American National Council for the Teaching of Mathematics.

The book may be obtained from Prentice-Hall, Inc., 70 Fifth Avenue, New York, N. Y. It costs $2.25.

Universal-Joint Catalog

A new 4-page catalog prepared by Curtis Universal Joint Co., Inc., Springfield 7, Mass., outlines the company's products and their construction features. It tells how to select Universal joints. It graphs static torque tests in inch-pounds, angle-of-operation efficiency, and frictional heat loss. It gives instructions on assembly and disassembly, and includes engineering data such as weights, specifications, dimensions, etc.

This literature may be obtained by requesting Form C1 from the company, or by using the Request Card at page 16. Circle No. 411.

Raymond F. Kopp, Treasurer of Merritt-Chapman & Scott since 1938 and a member of the organization since 1922, on January 31 succeeded Rear Admiral Carl H. Cotter (CEC) USN (Ret.), as President of the company.

R. F. Kopp Succeeds Cotter As New M-C & S President

Raymond F. Kopp, who joined the Merritt-Chapman & Scott Corp. as an office boy in 1922, became its President on January 31, succeeding Rear Admiral Carl H. Cotter, (CEC) USN (Ret.), who resigned so as to be free to devote the major share of his time to activities connected with the national preparedness program. Admiral Cotter will continue his association with M-C & S as a consultant.

Ralph E. DeSimone has been elected to the new post of Executive Vice President and General Manager in charge of overall operations, including industrial, building, marine, and heavy construction; marine salvage; and heavy hoisting.

A Report on Antiskid Road-Surface Properties

Bulletin No. 27 released by the Highway Research Board contains two papers sponsored by the Board's committee on Antiskid Properties of Road Surfaces and presented at the 29th Annual Meeting in December, 1949.

The Chairman of the committee, Ralph A. Moyer, reports on its activities and reviews research on skid resistance and road roughness. He also gives a progress report on the development of testing equipment and procedures for measuring skid resistance at the University of California.

The second paper, "Field Experiments With Powdered Rubber in Bituminous Road Construction" by Tilton E. Shelburne, Director of Research, and R. L. Sheppe, Associate Research Engineer, Virginia Department of Highways, describes three field experiments with powdered rubber conducted during the summer of 1949 by the Department. Both powdered natural and reclaimed rubber were used. Complete records at the time of construction on materials, quantities, procedures, temperatures, and workability are given, as well as follow-up studies based on visual observations and road-roughness measurements, and skid tests after the sections were constructed.

This bulletin may be obtained from the Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C. It costs 45 cents.

Data on Rust Preventive

A data sheet on Saf-pHilm rust preventive, a new dark-colored solvent-type organic metal preservative, has been prepared by The Swan-Finch Oil Corp., R.C.A. Bldg., W., New York 20, N. Y. This product, the literature says, protects highly finished surfaces, parts, and equipment prior to storage or shipment; it is a fast-drying rust preventive which forms a colored, yet transparent, film and can be removed with kerosene or solvent.

The literature describing this product may be obtained from the company by requesting Sheet No. 1-RP, or by using the Request Card at page 16. Circle No. 543.

Baldwin Buys Lima-Hamilton

At a closing settlement last December, The Baldwin Locomotive Works purchased substantially all the assets of the Lima-Hamilton Corp. in exchange for shares of Baldwin common stock. Baldwin is now known as Baldwin-Lima-Hamilton Corp.

Marvin W. Smith remains as President of Baldwin-Lima-Hamilton, and George A. Rentschler, formerly Chairman of the Executive Committee of Lima-Hamilton, is Chairman of the Board. Walter A. Rentschler is Vice President in charge of the Lima-Hamilton Division; A. A. Byerlein, H. F. Barnhart, and C. T. Ziegler are Vice Presidents of the Division.

New Contour Sloper Cleans Ditch Banks

A new canal or ditch-bank contour sloper has been developed by E. V. Briscoe & Son, Kerman, Calif. With a standard 20-foot blade, the sloper works on ditches or canals measuring up to 8 feet from bank top to bottom. The tractor requires about 14 feet of bank top for operation, the company says.

According to Briscoe, the sloper will remove all berms and cave-ins, eliminate grass and weeds, and finish to a smooth uniform bank. It will operate with water in the canal. The blade may be used to obtain slopes of any degree from 1 to 1 to 4 to 1.

The company points out that obstructions along canals will not interfere with the operation of the machine, since the Briscoe sloper blade can be swung up quickly and easily.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 413.

Briscoe's new contour sloper—with a standard 20-foot blade it works on ditches or canals measuring 8 feet from bank top to bottom.

Overload Cutout Or Warning Device

A new automatic, instantaneous, overload cutout or warning device to protect electrical circuits and mechanical equipment has been developed by the Rietz Mfg. Co., 441 Folsom St., San Francisco 5, Calif. The Techna Loadtrol has been used in conjunction with Rietz Disintegrators and their feeding devices to stop the feeder motor automatically when the Disintegrator becomes overloaded, and to start the belt feeder again automatically when the Disintegrator has freed itself of the load and is ready to handle more material.

The cutout can be furnished in various models to handle motor horsepowers ranging from 5 to 150. If required, it can be furnished with a current transformer and flush-mounted ammeter which will enable the operator to determine visually the load of the connected motor. The company suggests applications in the construction field for screw conveyors, belt conveyors, mixers, crushers, etc.

Further information may be secured from the company by requesting Bulletin No. 340. Or use the Request Card at page 16. Circle No. 458.

Booklet on Steam Boilers For Many Contractor Needs

A new 4-page folder on portable steam boilers has been prepared by Wm. Bros Boiler & Mfg. Co., 1057 10th Ave. S. E., Minneapolis 14, Minn. Three models, with 26, 41, and 55 generated horsepower, are available in four body types: a semitrailer with front rubber-tired caster wheel or adjustable stiff-leg, a skid chassis frame-mounted, or a truck-mounted combination with Bros circulator and heater.

Bros portable steam boilers are Scotch marine type, utilizing an exclusive 2-pass downdraft design which, the literature claims, produces fast steaming and uniform gas temperatures. The folder suggests their use for heating tank cars of asphalts, oils, tars, pitches; for pile driving by steam hammer; for heating storage-tank coils; for heating and thawing catch basins; etc.

Also available is a 4-page Bros product data sheet illustrating special portable boiler units. These include an electric-powered oil-fired unit; an electric-powered unit fired with manufactured or natural gas; a unit adapted to burn bunker C oil; a completely automatic electric-powered oil-fired unit; and an automatic unit fitted with rail-type wheels for use on trackage. Detailed specifications and data are given for all models.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 463.

Dallett Moves to Houston

The Dallett Co. of Philadelphia, which was purchased in 1947 by the Reed Roller Bit Co., has been moved to the Cleco Division Plant in Houston, Texas, where the production of Dallett tools and accessories is now in progress.

Asphalt Stabilizes Granular Road Base

Aggregates Are Scarce in Western Kansas, but This Design Improves Highway With Native Materials

• SOMETHING in the nature of modernized highway construction has been done by the Kansas State Highway Commission on U. S. 24 west of Colby; 8.988 miles of the transcontinental highway, graded on a new location in 1949, has been equipped with 7 inches of asphalt-stabilized aggregate base and a double asphalt surface treatment. The project is a part of Kansas' long-range highway program recently initiated.

This improvement eliminates 4 major murderous curves and numerous minor ones, and raises the roadbed above the plains to reduce the snow-removal headache. This section from Colby west was formerly one of the bad spots for the men with snowplows.

Southwest Sand & Gravel Co., of Great Bend, Kans., did the $156,989 job. In many respects the project is somewhat unique to that particular part of the state. For example, there were 60,-120 tons of aggregate for the asphalt-aggregate base, plus 3,468 cubic yards of cover material. The production of this material was, for northwestern Kansas, a sizable undertaking. The presence of modern equipment and streamlined road-building methods, while common to many other parts of the nation, is still an eye-catcher so far as the local residents are concerned.

Southwest's contract included the dressing of the previously built grade, the installation of asphalt-aggregate base, two asphalt surface treatments, and minor miscellaneous items. Cook & Cone, Ottawa, Kans., was awarded the seeding contract.

The highway has a 32-foot pavement on a 36-foot roadway. From the center line outward there is a parabolic crown of 2 inches in 8 feet, breaking at the 8-foot point to a uniform straight slope of ½ inch per foot. Generally speaking the new road passes through typical flat range country of the Great Plains, so the slopes are not excessively long anywhere.

One-Mile Sections Worked

Sections of approximately a mile long were worked in one spread.

Aggregate deposits are notoriously scarce in the Colby area, but 4 pits had been located by the contractor's exploration parties. The longest haul to any part of the work was about 11 miles.

Specifications for the base-course aggregate limited the spread between successive screens to not more than 25 per cent of material, and were as follows:

Size Screen	Per Cent Retained
1½-inch	0
1-inch	0-15
⅜-inch	0-30
No. 8	20-50
No. 30	Not more than 80
No. 200	89-95

The 7-inch base was constructed in two courses, each 3½ inches in thickness. Material for the first 3½-inch course was loaded from the various aggregate pits by a D7 Caterpillar and dozer, which pushed the material to a feeder trap. A small screening plant then scalped off the oversize, leaving mostly a pit-run product. This was hauled out to the road by a fleet of 16 dump trucks of various makes, and in sizes from 5 to 7 yards.

In order to blend the aggregate prop-

(Concluded on next page)

C. & E. M. Photo
Southwest's production setup for CM-3 cover material on the U. S. 24 job west of Colby, Kans. Aggregate for the asphalt base came from this and similar pits.

Asphalt Stabilizes Granular Road Base

(*Continued from preceding page*)

erly in the windrow, prior to mixing, the material was dumped in 8 successive windrows. In others words, one-eighth of the total windrow was dumped 8 times. As the trucks spread this material in the center of the roadway, two Caterpillar No. 12 motor graders and an Allis-Chalmers AD-4 machine blended the aggregate by road-mixing. When each segment was blended, it was bladed over to one side of the roadway and the next segment was processed. The total material for the windrow was eventually piled in one pile by the blades, and its volume ran 13.5 cubic feet per linear foot.

Mixing and Laying

Just before asphalt mixing began, the mile-long section of windrow was split in half. One of the smaller windrows was again halved, resulting in 25 per cent of the total material in one windrow.

From 3.9 to 4.2 per cent of MC-4 Positive cutback asphalt was then added to each small windrow by a Model 42 Wood Roadmixer. This self-propelled unit, powered by an International diesel, received asphalt from two 1,500-gallon Ford and General Motors transfer trucks. Standard Oil Co. of Indiana supplied the bitumen from its Sugar Creek refinery near Kansas City, Mo. The asphalt cars were preheated at the railroad siding by a Cleaver-Brooks heater.

One pass through each windrow was sufficient. When the Wood Roadmixer finished the first two windrows, that material was placed in one windrow by a motor grader, and the remaining dry aggregate was separated in halves. These next two windrows were mixed out in the same manner, and windrowed. Separation of the windrow was done by the good eye of the motor-grader operator, and the asphalt content was adjusted if necessary on the last windrow. When all the material was road-mixed, the graders bladed it to one large windrow.

One blade and a Seaman Pulvi-Mixer then went to work to aerate the volatiles out of the mix. It usually required 16 hours per mile section for this work. Careful field tests were run to check these results. When the volatiles were aerated out, the windrow was then laid down by blades, usually from the quarter point to start. Two Bros rubber-tire rollers worked behind the blades to develop compaction. A small flat-wheel steel pull-roller was also used.

Asphalt Surface

After the two 3½-inch stabilized base courses were finished, the double surface treatment was laid. The surface of the base was first primed with approximately 0.2 gallon of MC-1 per square yard. The first surface treatment consisted of 0.3 gallon of RC-4 per square yard, followed by Type CM-3 cover material, while the second application had only 0.25 gallon of RC-4 per square yard. This asphalt also came in to the Colby railroad siding, and was applied by a small Rosco distributor.

Type CM-3 cover material consisted of from 1 to 20 per cent retained on the ⅜-inch mesh; not less than 35 per cent on the No. 8; and from 90 to 100 per cent retained on the No. 30 mesh.

This material was produced in one of the pits centrally located. A somewhat more elaborate plant was required, because it was necessary to jackhammer and blast a shallow ledge of cemented conglomerate, or hardpan, over the deposit of acceptable material.

The plant setup consisted of a feeder trap with a D8 and dozer, which delivered the pit-run material by conveyor to a small, low rotary screen. Water from a nearby creek was pumped to the trommel screen to wash the excess fines away. Oversize material passed through a Pioneer 9 x 36 jaw crusher and back to the feeder trap. Troughs from the trommel passed directly to trucks, which hauled it to the stockpile. All plant power was International diesel engines.

The Colby job is among the first 8 or 10 similar projects in western Kansas, and represents an improved departure in Kansas asphalt construction. The old days when bituminous surface treatment could be laid on a dirt subgrade have been outmoded, sometimes forcibly and to the dismay of the maintenance department, by modern traffic.

This new highway, with 90 and 95 per cent densities in the subgrade, and a good stabilized base, set in a 150-foot right-of-way on permanent alignment, can be expected to receive whatever additional stage construction is necessary over the years

A. L. Beller, member of the firm of Southwest Sand & Gravel Co., directed the contractor's work, while Leo Chubb was Resident Engineer for the Kansas State Highway Commission. R. C. Keeling is State Highway Engineer, H. O. Reed is Engineer of Construction, and C. E. Priest is Division Engineer.

Difficult Construction, A Corporate Biography

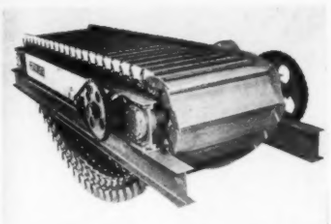
In its 30 years of existence, The Arthur A. Johnson Corp. of New York City has engineered and completed contracts whose values total $120,622,-891. To commemorate the difficulties overcome during those contracts, the company has issued a picture booklet describing some of its typical projects—the Toronto subway, the Atlantic Avenue improvement for the Long Island Railroad, the Sixtieth Street subway connection and the Sixth Avenue subway for New York City, the Van Wyck Expressway, site grading for the New York World's Fair, foundations for Stuyvesant and Peter Cooper housing developments, the Bermuda Army Air Base, the Letterkenny Ordnance Depot for the Corps of Engineers, the Sunbury Steam Electric Station in Pennsylvania, Quabbin Dike for Boston's reservoir water-supply system, Auburn Dam on the Schuylkill River, and the East River tunnels for the Pennsylvania Railroad.

Brief text and excellent pictures pose the problems encountered on each job, and how they were solved. Other jobs in the same classifications are listed, with location and price. The booklet also includes a who's who of Johnson executives, and a history of the firm.

To secure a copy of the booklet, "Difficult Construction", write to The Arthur A. Johnson Corp., 347 Madison Ave., New York 17, N. Y.

Three New Fruehauf Veeps

Three new vice presidents have been elected by Fruehauf Trailer Co.: E. S. Quarngesser, in charge of the eastern sales division; W. W. Siegrist, in charge of the truck-body division; and Harry R. Badger, in charge of scheduling.



Lippmann has added this new heavy-service manganese apron feeder to its line. It is 4 feet wide and can be made in various lengths.

A New Apron Feeder

A new manganese apron feeder has been added to the current line of feeders manufactured by Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis. The apron width of this heavy-service manganese feeder is 4 feet, and it can be made in various lengths. Pans, rollers, sprockets, and bushings are cast austentic manganese steel. The frame is heavy structural-beam style, firmly welded and supported with cross structural members.

All shafts turn on oversize antifriction bearings. The cast manganese pans hinge together in an endless apron and are self-cleaning and firmly supported by ribbed members for the heaviest impact service, according to the manufacturer. Pins are made of heat-treated alloy steel. Special high-capacity roller bearings are used on the end shafts to withstand tough service. The feeder can be operated optionally with either direct motor drive or from auxiliary equipment, with roller chain or belt.

Further information may be secured from the company. Or use the Request Card on page 16. Circle No. 438.

Hart Fills African Post

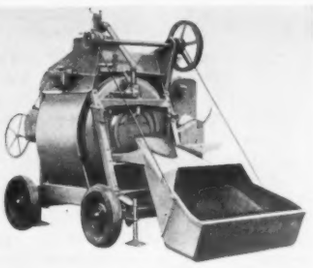
Gene Hart, former Field Engineer for R. G. LeTourneau, has been named Export District Representative for North and West Africa by that company. Mr. Hart came to LeTourneau in 1939 after studying engineering at the University of Illinois. As a field engineer he has spent much time abroad. He participated in a special transportation survey for the British government in British East Africa in 1949, and in 1950 he went to India under the auspices of the Indian government as a lecturer in a school for Indian government engineers.

Improved 3-Bag Mixer

Improvements affecting the design and performance of the Model 16-S concrete mixer have been announced by the Kwik-Mix Co., Port Washington, Wis., a subsidiary of the Koehring Co. of Milwaukee.

In construction features, the new 3-bag mixer is designed with heavier frame sections, a coil-spring mounting, and cast-steel drum heads with machined roller paths. Drum roller shafts revolve on larger, internal, double-row, self-aligning ball bearings mounted in pillow boxes attached to heavy trusses welded to the frame. The 27-hp gasoline engine is equipped with a clutch, and a spring-loaded hoist clutch is kept in constant engagement to eliminate frequent adjustments. Contact points on each end of the charging-skip supporting bar are now provided for the selective skip shaker, to produce a quick, positive, vertical action, the company says.

Other changes include an improved water valve and lever arrangement, and a positive Batchmeter actuating mechanism. The new model is quickly interchangeable to discharge either from side or end. As with the previous model, the Kwik-Mix Tower Loader attachment for loading trucks or depositing concrete at higher levels can be attached to the new mixer as an optional unit. Standard equipment includes discharge chute, automotive-type steering, and an automatic water-measuring system.



Heavier frame sections, coil-spring mounting, and cast-steel drum heads with machined roller paths are a few of the improvements built into the new Kwik-Mix 16-S concrete mixer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 488.

Army Names M. E. Kalette Construction Consultant

Under Secretary of the Army Archibald E. Alexander has appointed Michael E. Kalette, formerly President of James Stewart & Co. of New York, as special consultant on all matters pertaining to Army construction. His broad experience is expected to be useful in maintaining liaison between construction divisions of the Army and of other agencies of the Department of Defense, as well as with all branches of the construction industry. Mr. Kalette retired from James Stewart in 1949 to devote his time to consultative work. He lives in Oakland, N. J.

Emergency Light During Power Failure

A new portable emergency light that automatically provides a 30-watt sealed-beam light during power failures has been developed by Alliance Electric Works Ltd., 141 Bates Road, Montreal 8, Quebec, Canada. The Emergi-Lite is supplied as a complete unit with the battery fully charged, ready for immediate operation. It is only necessary to plug it into the nearest 110-volt ac outlet and move the battery switch to the "on" position. The pilot light will be illuminated and show that the beam is ready for any emergency. If a power failure occurs, the beam light will immediately be illuminated. According to the company, it will remain lighted for approximately 9 hours or until the power supply is resumed. After the power failure, the battery charging circuit is automatically connected and recharges the battery until a full charge is attained, when it automatically,

During power failures, the Emergi-Lite automatically supplies light for about 9 hours, or until power is resumed.

through a special relay, switches on to a low trickle charge which will not overcharge the battery. The complete unit is contained in a case of 18-gage sheet steel with anticorrosive interior finish and aluminum handle.

Each Emergi-Lite unit is a potential source of power for one or more additional lights which may be plugged into outlets at the bottom. The unit then acts as two or three emergency lights. The number of hours of emergency service will, of course, be reduced proportionately. The entire unit may be operated as a portable light by removing the plug extension and putting the battery switch in "on" position.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 429.

Hot-Spraybar Catalog

A 4-page catalog on Fraco full-circulating hot spraybars has been offered by The Fraco Mfg. Co., Richwood, Ohio. It points out that these bars are offered as standard equipment on many distributors and as easily attached replacement bars for any make of distributor. Cross-section drawings illustrate how the full circulation heats the entire spraybar before operation starts; no external heat is required. Other features include individually controlled nozzles, complete circulation for all positions, and round-tube construction.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 494.

In Hobart's special cold chamber at Troy, Ohio, a technician starts tests on a 30-kw generator.

New Cold-Room Tests For Hobart Products

New facilities to test Hobart products under subzero conditions have been announced by Hobart Bros. Co., Hobart Square, Troy, Ohio. In a special cold room, with an intermediate chamber to reduce cold losses in entering or leaving the cold chamber, Hobart products are now tested at temperatures ranging down to 65 degrees below zero.

Testing equipment consists of a graphic thermometer for continually charting ambient air or room temperature with a range of minus 100 degrees to plus 100 degrees F; an indicating potentiometer which has 24 stations, is self-balancing, and is calibrated directly in degrees Fahrenheit with a range of minus 100 degrees to plus 1,200 degrees F with appropriate thermocouples; a two-way sound system so that observers conducting tests can communicate with technicians outside of the room; and an inspection window with 6 panes of thermo-glass to maintain insulation.

Accidents Are No Accident

"Accidents Are Avoidable." That's the keynote of the new catalog prepared by Stonehouse Signs, Inc., Ninth at Larimer, Denver 4, Colo., manufacturer of a wide variety of signs for accident prevention. The catalog points out that control of hazards is a vital part of every safety program and that accident-prevention signs warn, educate, and impress upon workers the importance of thinking and acting safely. They also apply to persons outside your organization who are subject to possible injury from your construction activities.

The 64-page catalog illustrates hundreds of standard stock-worded Stone house signs. The subjects relate to use of explosives, traffic control, equipment and machine operation, safety slogans and reminders, electricity, etc. A number of traffic signs are available. Many of the signs themselves are reflectorized. Complete descriptions, illustrations, and prices are include in the folder.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 495.

Conveyor-Belt Bulletin

A new 26-page catalog section on conveyor and elevator belts has been prepared by The B. F. Goodrich Co., Akron 18, Ohio. With the help of many photographs, the booklet describes all major parts of the belts, and their functions. It explains that increased service life with decreased maintenance is made possible by the belt construction, and it provides complete engineering data on each belt in the company's line.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 525.

Kiewit Co. Schedules Its Equipment Upkeep

Contracting Organization Ready for World Situation With Maintenance Program Second to None

• FOUR years ago, Peter Kiewit Sons' Co. of Omaha standardized and improved on its equipment-upkeep program. With a critical world situation again placing emphasis on equipment care, the Kiewit organization is in the enviable position of having a program it will not have to change to get the most life out of its machines.

The program is based on the sound theory that a machine must work at maximum efficiency to make money. Obviously it cannot do these things if it is broken down or in poor working order.

To see how the program works in practice, this magazine visited Poudre River Supply Canal, 15 miles northwest of Fort Collins, Colo., where Kiewit has a $1,216,698 contract with the U. S. Bureau of Reclamation for the construction of about 5.2 miles of canal and structures. The job is a typical irrigation project of moderate size. There are approximately 379,000 cubic yards of dirt and rock to move, and 6,400 cubic yards of concrete to place in 4 siphons and various box culverts.

Kenneth Mann, a Kiewit employee for over ten years, is Project Manager, and John Booth, who has been with the organization slightly over a year, is Mechanic Foreman. Booth has been a nut-buster for many years with other firms, and he says the Kiewit system is the best, simplest, most efficient one in his experience.

The Equipment List

The trend toward all-out mechanization of today's construction projects is exemplified by a total of almost 100 pieces of equipment on the Poudre Supply Canal job. Rolling stock consists of 38 trucks and pickups, and includes the truck mixers which place structure concrete. Three draglines on excavation—a Bucyrus-Erie 38-B, a Northwest 80-D and a Northwest Model 41—have to be maintained in top-notch condition. So does a Lorain ¾-yard Moto-Crane.

Tractors include 10 Caterpillar D8's with two D6's, and there are two No. 12 motor graders. Four scrapers are used for short-haul excavation: two Model 80 Caterpillars and two Model W LeTourneaus. There are sheepsfoot rollers, 8 pumps, 6 light plants, 7 air compressors, and 5 mobile service rigs.

Altogether that is a considerable investment of money in equipment, and since many pieces are interdependent, all must be kept in top operating shape.

Service Is Programmed

Under the Kiewit system, maintenance is programmed for every piece of equipment. This program is a composite of the manufacturers' recommendations, tempered in a few cases by the company's long experience. The program is divided principally into two divisions: weekly and monthly service. This service is not only performed faithfully as to detail, but is also entered on a visual record chart which shows at a glance the upkeep status of any unit.

Consider, for example, a truck. The Kiewit guide sheet for truck service lists the following weekly service by number:

1. Cooling System: Check fan-belt adjustment, inspect radiator, hose connections, water pump, etc. for leaks.
2. Electrical System: Check battery specific gravity and electrolyte level. Check all connections for tightness and cleanliness. Check lights and horn.
3. Operating Controls: (a) Check for free play in steering mechanism. (b) Check service brakes for 2-inch pedal clearance when applied. (c) Check emergency brake for not over two-thirds travel. Check ratchet. (d) Check clutch for minimum of ½-inch pedal lash. (e) Check all instruments.
4. Front End: Check for bent, worn, or loose members throughout the assembly, such as drag links, pitman

(*Concluded on next page*)

P. D. Kessler, Inc., of Northumberland, Pa., has started construction on 3¼ miles of four-lane divided highway between McAdoo and Sumatra, Pa. Pictured on the job is a Northwest shovel loading Model VD 10-ton Euclids powered by General Motors diesels.

Kiewit Co. Schedules Its Equipment Upkeep

(*Continued from preceding page*)

arms, tie rods, springs, steering-gear case housing, etc. Check grille mounting.

5. Rear Axle Assembly: Check for loose wheel and axle bolts, and companion flange nut. Check grease seals, gasket leaks, springs, and mounting.

In addition to these items, weekly service on a truck includes a change of engine oil. This is a must for every piece of equipment.

Monthly truck service continues the system of numbers, as follows:

6. Wheel Bearings: Check front and rear-wheel bearing adjustment. Adjust if necessary.

7. Engine Tuneup: (a) Adjust valves according to engine specifications. (b) Check plugs, distributor gap, and timing. (c) Tune carburetor and set idling speed. (d) Check intake and exhaust system. (e) Correct leaks and other indications of trouble.

8. Fuel System: Empty sediment bowl. Check for leaks.

9. Tighten Bolts: Tighten engine mounting bolts, body bolts, all pan bolts, wheel-lug bolts, and axle bolts.

This service for a truck, like all other units of equipment, is standardized from Nebraska to California, wherever Kiewit equipment is working. There is a sheet for every major machine. Photostats of the most important sheets, such as those for tractors, scrapers, shovels, and so on, are posted on the shop bulletin board with the record chart so the mechanics can refer to them quickly. As the maintenance service is performed "by the numbers", it is entered on the maintenance record chart, which has enough space for 4 months of service. It becomes a very simple matter, then, to see what pieces of equipment need service on any particular day, week, or month.

Booth swears that's all there is to it. First, he has a maintenance guide sheet put out by the Omaha Office Equipment Division for the company. Second, he sees to it that each unit gets every bit of service these sheets call for; in other words, this isn't merely a paper record. It is a combination of system and hard, routine work.

Wherever possible, Kiewit has standardized on such materials as oil and grease. For example, every engine on the Poudre Supply Canal uses a heavy-duty engine oil, and that includes all gasoline engines. Heavy-duty engine oil is a high-detergent engine lubricant especially recommended for diesels, but it has also worked excellently in the gasoline engines. By using only the one type of oil, less storage space is required and there is never much danger of running short on some particular lubricant.

Engine lubricating oil is drained from every unit once a week, regardless of whether the engine worked only one shift per day. Regular, routine service may be tiresome to mechanics, but it has reduced appreciably the number of spare engines and parts formerly necessary. As a general rule, major repairs are made on this project during the idle shift at night, while maintenance on the working shifts is limited to more minor items which do not reduce effective working time.

"We had considerable inertia to overcome when this maintenance program was started", said Kenneth Mann. "Some of the old-timers didn't think too highly of it. It took about 2 years before they saw fully what its advantages were, and how much better it spread their work out.

"It's second nature now. They are trained to use the check charts, to do all the work they call for, and mark it up on the master chart."

Practical results are startling. On this project, 300,000 cubic yards of material has been moved and a considerable amount of concrete has been poured with the loss of only one bearing! That was a sheave bearing from a scraper. This unusually efficient record is not an exception by any means; it merely exemplifies what Peter Kiewit Sons' Co. has done throughout its far-flung construction empire with its equipment maintenance program.

Wellman Buys Anker-Holth

The Wellman Engineering Co. of Cleveland has purchased the property and business of Anker-Holth Mfg. Co., of Port Huron, Mich. As the Anker-Holth Division, the company will continue to manufacture hydraulic and air-operated cylinders, chucks and collets, air valves, and accessories. J. C. Hodge, Wellman Executive Vice President, will supervise the operation of the new division. W. L. Komph will continue as Manager of Sales and Engineering, and F. J. Theisen as Plant Manager.

The construction industry is really taking to the air these days. Contractors, dealers, and manufacturers are using planes to supervise work, deliver parts, make sales and service calls, or whatever. Here Joe Brunner, Manager of the Equipment Division of Kay-Brunner Steel Products, Inc., Los Angeles, boards the Navion which he flies regularly on company business.

Automatic rewind and interchangeable blades feature the new 50-foot Longboy steel tape.

An Automatic Rewind For New 50-foot Tape

A full-length 50-foot steel tape which rewinds automatically has been developed by Master Rule Mfg. Co., Inc., Middletown, N. Y. Rule blades are interchangeable so that tapes divided in eighths of an inch can be replaced by tapes divided in tenths and hundredths of a foot, right on the job; thus worn or damaged tapes can be replaced without discarding the case or rewind mechanism.

The Longboy rewinds with a constant-retracting torque, whether the full 50 feet or only the last inch is out, Master reports. This is made possible by the incorporation of a new negator-type spring in its planetary coiling mechanism. Simple thumb pressure starts the action; release of this pressure stops it. Thus the moving tape is under full control at all times, and only one hand is required to manipulate it.

The automatic rewind should lengthen the life of the tape, says the company, since most field tapes are damaged while being dragged or laid aside between measurements. With the Longboy, it takes 10 seconds to rewind 50 feet.

One-man traversing is also practical without retracing steps. A hook, a stake, or a finishing nail is used to hold the end-loop during measurement, and that loop is freed after the measurement by a flip-wave sent along the tape. Rewind force is sufficient to draw the tape back. Cleaning may be accomplished by running the tape through a cloth (preferably oily) held in the left hand as the rewind proceeds.

The case, of formed steel and covered with tough Fabricoid, is sealed against dust and dirt. The tape itself is ⅜ inch wide and made of high-carbon spring steel, nickel-plated for protection from moisture. Internal parts are all of corrosion-resisting materials.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 466.

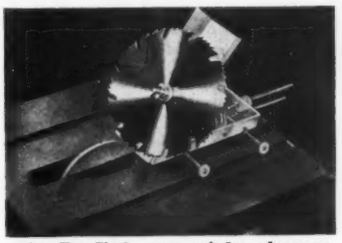
Gar Wood Appointments

Gar Wood Industries, Inc., Wayne, Mich., has appointed Dwight L. Mink, District Manager in the midwest, and Robert E. Owen, District Manager in the southwest region. Mr. Mink has been with Gar Wood for 27 years, and before his recent promotion was Manager of the Chicago branch. Mr. Owen has had 17 years of experience in the truck equipment field.

New Saw Sharpener Uses the Saw Table

The Tru-Circle saw sharpener, a new unit which sharpens circular saw blades right on the saw table, has been developed by A. D. McBurney, 317 E. 4th St., Los Angeles 13, Calif. Designed to fit all known saw tables, the jig will gum, joint, and sharpen combination, crosscut, rip, or novelty blades from 6 to 10 inches in diameter. It may also be used for touching up the raker teeth of combination blades.

The Tru-Circle is a metal frame upon which is secured an upright carrier jig. Fixed with adjustable outriggers and grippers, the entire unit can be moved forward or back in the miter slots of the saw table. The carrier jig is designed to hold all diameters of blades within its 6 to 10-inch range, and is itself mounted at an angle to the grinding stone fixed on the saw's arbor. This angle may be changed by moving the supporting legs up or down a series of holes provided in both sides of the carrier jig.



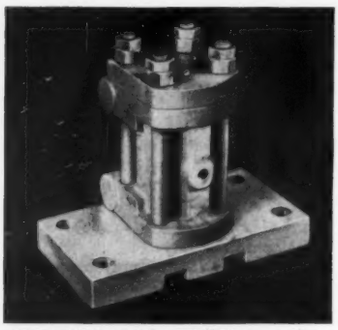
The Tru-Circle saw grinder sharpens circular saw blades right on the saw table. Its blade-diameter range is 6 to 10 inches.

The fixture may be adjusted for proper jointing if the blade is in extremely bad condition; for gumming operations; and for assuring accurate pitch, angle, rake, and depth. A lever at the foot of the jig raises a dog so that each tooth of the saw blade may be indexed before grinding. A table stop at the rear of the frame is adjustable to several thousandths of an inch to provide against overtravel of the jig as it is pushed against the grinding wheel. The wheel, specially made by Chicago Wheel & Mfg. Co., is furnished as part of the complete package.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 418.

Ryerson Moves to New Plant

Joseph T. Ryerson & Son, Inc., steel distributor, has moved into its new and larger steel-service plant and office building at 3475 Spring Grove Ave., Cincinnati. Total floor space of the new plant is almost 4 acres; the L-shaped office building comprises 10,000 square feet of floor space. Property nearby is available for future expansion.



No metal-to-metal pounding, no noise, no springs — these are the features claimed for Cannon's new EM Quiet Type vibrator for bins, hoppers, etc.

New Hopper Vibrator

A new EM Quiet Type vibrator has been introduced by Cannon Vibrator Co., 1108 Power Ave., Cleveland 14, Ohio. Designed for use on bins, hoppers, chutes, shakeouts, etc., it employs heavy pistons and longer strokes. The manufacturer claims that there is no impact of the piston on either end—no metal-to-metal pounding, no springs, no noise. The unit is furnished in 1⅝ to 4-inch sizes, and is said to be interchangeable with any bolted-type vibrator.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 550.

New Portable Crane Mounts on Truck Bed

A new Memco portable crane, manufactured by De-Lux Neon Mfg. Co., 1007 N. W. 36th St., Oklahoma City 3, Okla., is designed to mount on the platform bed of a ¾-ton pickup or 2-ton flat-bed truck. It has a reach up to 46 feet, depending on the height of the truck on which it is mounted, and can be extended and raised or lowered manually or electrically. It will revolve 360 degrees, right or left, and automatically lock in place when rotation is stopped. Fully extended and set at a 20-degree angle to the vertical, the Memco crane has a load lift capacity of 1,000 pounds.

The telescoping tubes are made of heavy-wall seamless steel tubing. Steel-to-steel friction between the telescoping tubes is prevented by means of bronze-lined bushings and collars. Major points of thrust ride on ball thrust bearings. Boom extension lines are 5/16-inch and double ¼-inch cable. The company points out that the crane base occupies an area of only 44 inches square on the truck bed.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 530.

Dragline-Bucket Data

Two new bulletins describing Page Automatic dragline buckets have been prepared by Page Engineering Co., Clearing Post Office, Chicago 38, Ill. Bulletin No. 455 covers the standard sizes, ⅜ to 3-cubic-yard capacities, used on most jobs. Six different solid, perforated, and slat-type bucket models are available in each size classification. Complete specifications are given for all models and sizes, plus data on the principle of automatic loading with Page buckets.

Bulletin No. 456 presents larger Page Automatic dragline buckets ranging in capacity from 4 to 30 cubic yards. It illustrates them performing various types of work and points out that they are furnished in alloy-steel or manganese-steel plate.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 455 for Bulletin 455 and No. 456 for Bulletin 456.

Cook Heads Division

Robert M. Cook has been appointed Manager of the newly organized Strata-Crete Sales Division of Great Lakes Carbon Corp. He was previously Vice President and General Sales Manager of Security Engineering Co. He will maintain offices at 5845 Atlantic Ave., Long Beach, Calif.

The Manco 15 bolt cutter will cut No. 9 form wire, case-hardened sheet-metal screws, and similar materials.

A New Bolt Cutter

A new 15-inch bolt cutter has been developed by Manco Mfg. Co., Bradley, Ill. Features claimed for the Manco 15 include formed-steel handles that will not yield under pressure; high-quality tool-steel jaws that may be easily resharpened and replaced when required; and a gun-metal-blue finish for rust-inhibiting, with all undersurfaces blued before assembly. The Manco 15 may be used for cutting No. 9 form wire, case-hardened sheet-metal screws, and most types of high-carbon and alloy rod and wire.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 440.

Large Blast-Hole Drills

The 20-page Catalog B offered by The Sanderson-Cyclone Drill Co., Orrville, Ohio, contains complete information on the company's No. 1000 Series of large blast-hole drills. These units are built in three models, the largest having a tool capacity of 5,000 pounds. The catalog describes the Cyclone Air-Speed Spudder as well as the main frame, V-belt drive, main countershaft, treads, derrick, operating platform, cable drum, and pistons. The drills may be powered by gasoline, electric, diesel, or steam units and used in a variety of construction and quarry work. On-the-job photographs and detailed specifications are included in the catalog, along with lists of typical tools for blast-hole drilling.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 537.

This cutaway view of the Model TB Perry cooling-system filter shows the flow of coolant through the electro-chemically-activated replaceable filter element. Perforated corrosion-resister plates above and below the filter element absorb electrolytic action and prevent corrosion. Harmful residue is deposited in a visible sump located at the bottom of the filter unit.

Develops New Filter For Cooling System

The expense and lost time of engine breakdown is often due to overheating troubles in liquid-cooled gasoline and diesel engines, says the Spark-O-Liner Corp. The company's new electro-chemically - activated cooling - system filter is designed to eliminate breakdown due to this cause. The filters are made for all types of automotive and stationary water-cooled engines. After installation, the filter element can be easily replaced.

Further information may be secured from the company at 601 Eleventh Ave., S., Minneapolis, Minn. Or use the Request Card bound in at page 16. Circle No. 506.

Precision Power Saw

A new precision flat-blade power saw, designed for wide application in cross-cutting, ripping, notching, and framing hard and soft woods, has been developed by Wright Power Saw & Tool Corp., 292 Longbrook Ave., Stratford, Conn. The weight of this unit, including saw blades, is 15 pounds. It has an overall length of 46 inches and a single-cut length of 21 inches. The depth of cut is unlimited. A fully adjustable handle enables cutting in any position, and the blade is in full view of the operator, permitting him to keep on the line for any job.

This lightweight unit operates on the Wright cutting principle, with twin, interlocked, opposed-stroke, reciprocating saw blades. It is air-operated and is said to consume less than 60 cfm at 90-pound air pressure. It will operate at 70 to 100 pounds. The safety throttle automatically stops the sawing the instant it is released, the company says. The alloy-steel saw blades are high-tempered and may be resharpened in the same manner as a hand saw. The company points out that the saw blade finishes with a smooth 3/16-inch kerf.

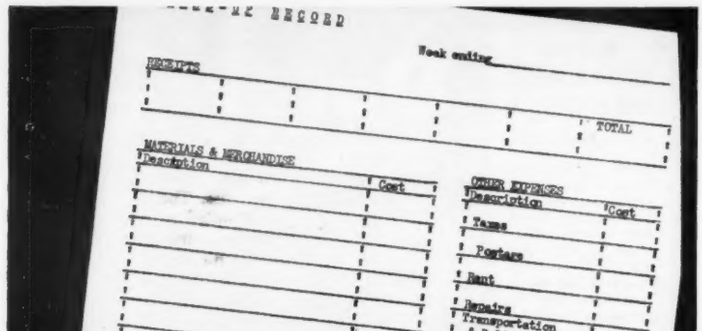
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 479.

The Wright air-operated flat-blade saw weighs 15 pounds, is 46 inches long overall, and has a single-cut length of 21 inches.

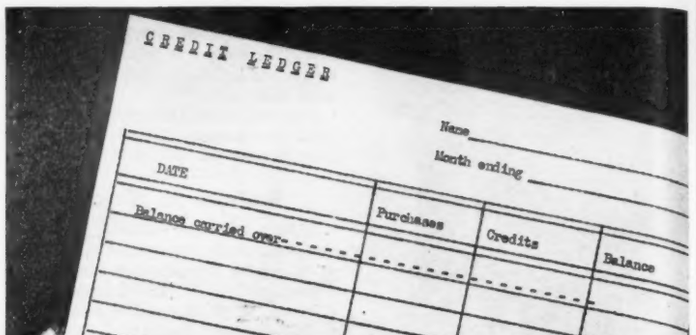
Bulletin on Welders

A new two-page bulletin on Shield-Arc engine-driven welders has been prepared by The Lincoln Electric Co., Cleveland 1, Ohio. These units provide a broad range of welding currents up to 300 amp for the Model S-7078 and up to 400 amp for the Model S-7066—and are specifically designed for use on heavy-construction and maintenance work. The circular provides full specifications, on-the-job illustrations, and data on engine construction and standard and optional equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 508.



Form 1—a main round-up form which presents day-to-day facts compactly.



Forms 2 and 3—a credit ledger (above) and an inventory record.

Bookkeeping Need Not Be a Chore

Five Basic-Bookkeeping Forms for the Small Contractor, and A Summary Ledger for Larger Firms Give the Facts Needed for Filling Out Income-Tax Returns and Guiding Operations

By DAVID MARKSTEIN

• TO some contractors and professional engineers, bookkeeping is the hardest chore in the world. They dread the end of the year when it is necessary to dig out the figures on income and expenses for Uncle Sam's Collectors of Internal Revenue. But to other contractors—even men who keep their own books—the job of maintaining simple, accurate records is an easy routine. The difference between puzzlement and roll-off-the-books accounting is usually a matter of system.

Basic System for Small Firms

Illustrated here are five steps to sound bookkeeping. They can help the small contractor—and the big operator with batteries of bookkeepers, too. The five forms, bound together into a brief folder or an ordinary looseleaf notebook, tell not only all facts needed to fill out an income-tax return for Uncle Sam, but facts needed for guidance in efficient business operation as well. Good bookkeeping is one of the marks of a good business man. A company without records is like a ship without a rudder. Records are important—but they need not be irksome.

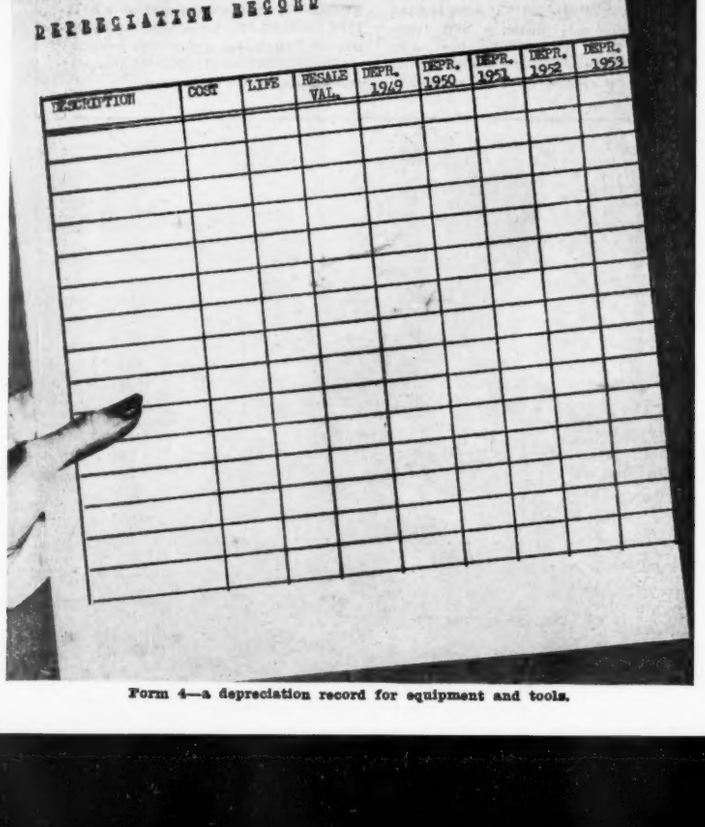
Form 1 is the main round-up form which presents the day-to-day facts compactly. It tells how much you took in, how much you spent, what you spent it for. It sums up the wage records, including social security and income taxes withheld, and gross and net wages for each employee.

Form 2 is a credit ledger to keep track of accounts. On a single sheet, this ledger summarizes every payment and completed job order for an account. You can spot the customer who is lagging too far behind in his payments by noting the amounts carried over from previous months.

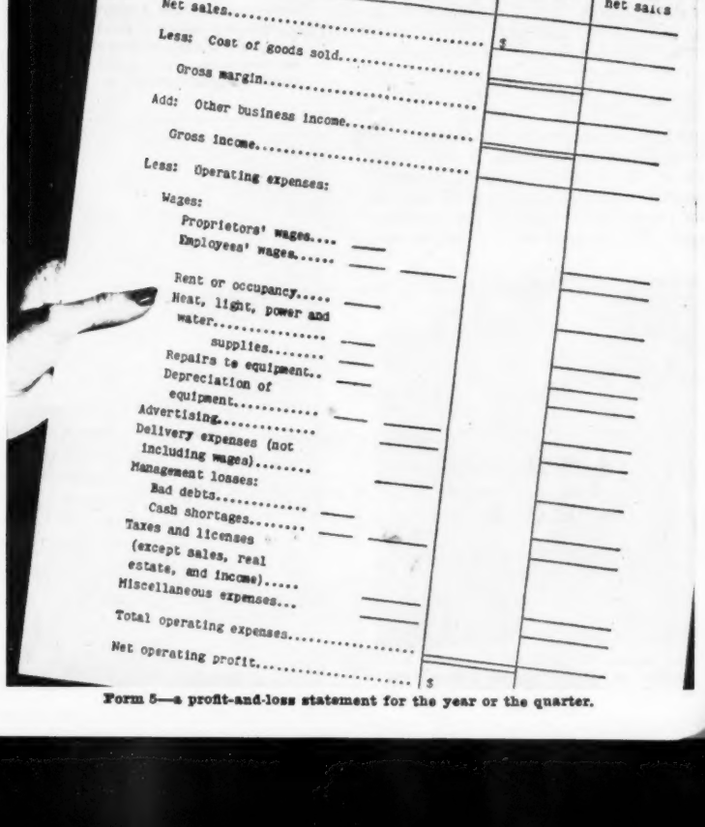
Form 3 is an inventory record. On it you note purchases and withdrawals from warehouse stock of equipment and building supplies. The amount in the final column tells when quantities are too low so that re-orders can be put in.

Form 4 is a depreciation record. Most contractors are aware that—for income-tax purposes, as well as for good business operation—their heavy equipment and tools with a life longer than one year must be depreciated. This record makes the bookkeeping part easy. In column one, note the name or

(*Continued on next page*)



Form 4—a depreciation record for equipment and tools.



Form 5—a profit-and-loss statement for the year or the quarter.

Date	Remarks	CASH			BANK			CUSTOMERS			SALES				PURCHASES				CASH OPERATING EXPENSES														PERMANENT ASSETS		ALL OTHER PAYMENTS		
		Rec'd.	Paid out	Balance	Deposits	Checks issued	Balance	Charges	Credits	Balance	Departments A	B	C	Total	Departments A	B	C	Total	Owner's wages	Emp'ys. wages	Rent	Phone	Elect.	Supplies	Advt.	Delivery	Taxes and Licenses	Social Security	Other expense.	Withdrawals	Name of Asset	Amt.	Explanation	Amt.	Other income

A summary ledger is the key to successful bookkeeping whether a company does a $2,000,000 or a $2.00 volume a month. This one is designed to be used for one month.

description of the item, in column two its value determined by cost to you. In column three is space for indicating its useful life in years. If you expect it to have a trade-in value at the end of that time, mark the estimated trade value in column four. Then in columns for various years, indicate how much of the item's value should be charged off each year. A $1,000 item with a life of five years and a trade-in value of $200 at the end of that time would be depreciated $160 annually. That figure is arrived at by dividing the $800 "net" ($1,000 cost less $200 estimated trade-in value) by five, the number of years of useful life.

Form 5 tells how well (occasionally, how badly) your business did during the year. It is a profit-and-loss statement. From it come the facts for filling out the income-tax return. The yearly profit-and-loss statement is actually a summary of facts in the 52 weekly round-up sheets (form 1). Many contractors do not like to wait a full year before getting a summary of how they are doing. They fill out profit-and-loss statements quarterly, occasionally even monthly, with a master profit-and-loss statement made for the full year on January 1 (or at the end of the fiscal year).

System for Larger Firms

No long ago, a survey of why businesses went bankrupt was undertaken by the U. S. Chamber of Commerce. Findings of a study the Commerce boys made in New Jersey and Boston showed that only 27 per cent of 494 failed firms in those two localities kept adequate business records.

The same isn't true by any means when it comes to successful large contracting firms. Yet not every contractor keeps the kind of business records which flash warning signals when things are being done the wrong way; or tell him every one of the myriad facts about his far-flung operations which he needs to know; or—important these days—give him the figures which must be dug out periodically for Federal, state, and sometimes city or county officials on their various tax and licensing forms. Those who do keep such complete records often keep more burdensome ones than are necessary.

We have just outlined a simple system of basic bookkeeping designed for the smaller company. Big outfits need more complicated records and books. Now let's consider the summary ledger which is the key to successful bookkeeping, whether the company does a $2,000,000 or $2.00 volume a month. A later article will show how to keep the day-to-day records which furnish the facts for this master ledger, and finally how to transfer ledger facts to a profit-and-loss statement for guidance in formulating business policies and for data in filling out tax returns and records.

Questions to Be Answered

To plan a bookkeeping system, it is necessary first to decide just what jobs the accounts should accomplish. A successful contractor has to have certain facts at his fingertips constantly to guide him. The books should supply ready answers to these questions: How much business am I doing? How much money is owed to me, and can the company stand having this much money tied up? How much cash do I have on hand and in the bank? Is this the amount I *should* have, or are there shortages? How much inventory do I have on hand? How much money do I owe on account? On loans? How much were my expenses? How great is my gross margin? How much net profits did my company earn? How much income tax will I have to pay? What are the trends—is the company progressing from year to year? What are the expense trends from year to year and from month to month? How much can I afford to pay myself for personal salary and still leave healthy profits in the business?

The system of bookkeeping we are going to consider is capable of giving a ready answer to each of these questions. It is simple enough to be worked by the contractor himself, if need be, yet thorough enough to afford exact control over every operation of a complex business structure.

Summary Ledger

The key to it is the keeping of an accurate summary ledger which reflects—on one sheet—every operation of the business. The summary ledger is not a detailed recording of every wage payment, inventory record, or cash control. Rather, it summarizes the situation of the company at any given moment. The form illustrated is designed to be used for one month. Let's see how it works by considering several transactions during a typical month in the business affairs of a contractor whom we may as well call John J. Jones.

On June 1, Jones' secretary put a voucher on his desk for $15.03 to purchase a roll of 3-cent stamps for her desk. Jones signed the voucher, put it into the petty-cash drawer from

(Concluded on next page)

Bookkeeping Need Not Be a Chore for You

(Continued from preceding page)

which he withdrew the same amount of cash, and entered under the "paid out" column of the cash account, at the extreme left, the amount $15.03. The explanation of what this $15.03 was spent to buy was entered under "remarks" in column two as, simply, postage. The date was entered in the first column of the summary ledger.

Later in the day the mailman arrived, bringing checks for work done that totaled $509.65. A deposit slip was made out by the office clerk, and Jones again entered the date in the appropriate column, followed by an entry (on the same horizontal line) of the amount under "bank deposits". He also noted the new balance this made for the company's checking account. Finally, he entered the names of the customers under "remarks", and noted the proper credits in that column, along with balances left on these customers' accounts.

On the third of June, a contract for a road job to be done over in a neighboring state was signed. *This was not entered* until the job was completed some months later, when Mr. Jones noted the name under "remarks", the proper date, and the contract price. He also checked "Department A"—his designation for the section of his far-flung operations concerned with road-building work.

The same Department A was engaged on another project for a county board of supervisors and found it necessary on June 9 to order sand and gravel from a local supplier. These facts and figures were duly entered under "date", "remarks", and "purchases" columns. On the same day, his office paid an invoice sent by a stationer for ten reams of yellow onion-skin paper. This entry was made under "supplies" for Department C, the headquarters staff.

On June 15, John J. Jones' office prepared checks for people on the payroll and Jones signed his own pay slip, entering the facts under "cash operating expenses"—being careful, as with all of his bookkeeping, to note the date and the proper names and reasons under "remarks".

A newspaper presented Jones with an invoice on June 20 for bid advertising on work he was subcontracting. He paid the invoice immediately to secure a 2 per cent discount for cash within three days, and charged the amount under "advertising", along with date and explanation in the "remarks" column. Upon writing each of these checks, Jones carefully noted the figures under the "bank" account, bringing his balance up to date each time.

On June 25, invoices were sent out to two small customers for whom the Jones Construction Co. had done minor jobs. The names of these customers were entered under "remarks", the date in the appropriate column, and the amounts under "charges" in the account for "customers".

Before June 30, Jones had to send in accumulated social-security sums withheld from his employees' wages, along with the 1½ per cent that came out of the company's till. The company-borne tax was entered in the "social security" column under "operating expenses". When time came to pay the state social-security payroll tax, this was also entered in that column on the summary ledger for June.

Using a large page size, contractor John J. Jones was able to fit all of his month's facts and figures on the single ledger page. If his operations grow to a point where one ledger page will no longer hold them, Jones plans to set up the ledger with weekly—in place of monthly—summary sheets.

This summary record, as its name implies, is merely a summary of company operations for a period, giving a complete picture in one ledger. There are other facts which a contractor's books should be able to tell him. The succeeding article in this series will discuss these facts and figures, and show easy-to-maintain records that bring them out.

Heavy Hauling Trailers

Literature on heavy-duty hauling trailers, both center-dump and rear-dump types, has been prepared by Omaha Standard, 2411 W. Broadway, Council Bluffs, Iowa.

The center-dump trailers are custom-built and are available in capacities of 8 to 14 yards. The 10-yard trailer, for example, weighs 6,500 pounds complete. The bodies are made of 8 to 10-gage steel plates designed as an integral part of the trailer chassis. The main members of the chassis are structural-steel channels. Bendix-Westinghouse air brakes are standard and vacuum brakes are optional.

Omaha Standard hydraulic rear-dump trailers come in single-axle and tandem-axle models. They, too, are custom-engineered. The circular outlines standard and special features of the chassis, body, and hoist. It also points out that accessories such as extension sideboards, doors, chutes, swinging partitions, top boxes, etc. are available for handling all types of materials, for separating materials, and for increasing payload capacities.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 527.

The Black & Decker Deluxe Super-Service valve refacer will traverse-grind all valves from 0 to 90 degrees.

A New Valve Refacer

A new valve refacer which will traverse-grind all valves from 0 to 90 degrees has been introduced by The Black & Decker Mfg. Co., Towson 4, Md. It handles valve stems from 9/32 to 11/16 inch and has a valve-head capacity up to 4 inches in diameter. The wheel head is at a 20-degree offset permitting traverse-grinding of any angle valve face including the flat type.

Standard equipment for the valve refacer includes two universal motors; 1-gallon coolant tank; universal wheel dresser with diamond; 5-inch grinding wheel; 4-inch grinding wheel; attachment for grinding valve stems, tappets, or rocker arms; coolant regulating valve with tubes; Allen wrench; grinding-wheel coolant; gear lube; and leatherette cover to protect the entire machine from dust. This tool is available for 115 or 220-volt lines, or on special order for 125 or 240 volts.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 548.

Diesel-Engine Lubrication

The ability of the diesel engine to utilize the stored energy of the less volatile and less costly fuels derived from petroleum has accounted for its tremendous use in the last 50 years. Of equal importance to cost-conscious owners of diesels are engine operation and maintenance. For this reason, the Cities Service Oil Co., 60 Wall Tower, New York 5, N. Y., has prepared a 64-page booklet on diesel-engine lubrication. How operating and maintenance costs can be reduced and satisfactory performance maintained through effective lubrication is the primary subject of the booklet.

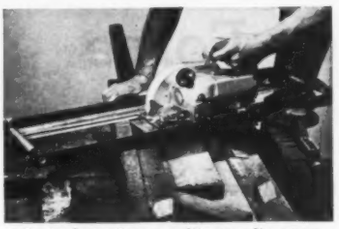
Diesel operating principles, diesel fuel-injection systems, combustion-chamber design, and fuel quality are treated as a prelude to the discussion of lubrication and lubricating systems. The booklet carefully outlines lubrication problems and their solutions. It also offers a lubrication chart indicating company recommendations for the various makes and models of diesel engines.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 516.

Portable Saw Guide

The new Universal saw guide permits precise crosscutting, mitering, beveling, and ripping with any standard portable electric saw, according to the Universal Saw Guide Co., 1080AA Howard St., San Francisco, Calif. It consists of a rigid clamping device which attaches to the front member of a wooden miter box and an adjustable locking quadrant to which are attached either the crosscutting or the ripping cradles.

These cradles have adjustable sidebars to accommodate the shoe of any standard saw from 6 to 12 inches in size. They can be changed quickly to permit the use of more than one type of saw on a single job, the company says. In ripping, the saw can be inverted to form a table saw complete with guide fence. Extension rods are available for panel cutting.



The Universal saw guide permits crosscutting, mitering, beveling, and ripping with any standard portable electric saw.

For portability and ease of handling, all castings are of high-strength aluminum alloy. Steel parts are cadmium-plated against corrosion. Machine work is held to close tolerance to achieve operating rigidity, ease of adjustment, and repeatability of cut, the manufacturer says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 453.

Portable Aggregate Plants

A new 20-page bulletin on portable crushing and screening plants, both two and three-unit types, has been prepared by Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill. Double-page spreads describe the primary breaker unit, the primary unit, the secondary unit, and the complete two and three-unit gravel plants.

Two-color material-flow diagrams are given for the two and three-unit plants, and for the modifications possible on standard Austin-Western equipment. The literature points out that this equipment is designed for either quarry or pit use in handling rock or gravel, and that plant production ranges up to 550 tons of gravel per hour. Additional information and illustrations are given on the Austin-Western belt conveyors, bins, and screens.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 422.

Skimpy Funds Force Money-Saving Design

Missouri, Long on Work but Short on Money, Resurfaces and Rebuilds With Concrete Near Mississippi River

• A $521,837 CONCRETE-paving contract, scattered over 16 miles of U. S. 61 south of New London, Mo., is the Missouri Highway Department's answer to a money shortage. When voters rejected a proposed gasoline-tax increase last spring in one of the most crushing defeats yet suffered, the Highway Department had to stretch its unspent money as far as possible to forestall a possible disastrous highway situation.

South of New London, U. S. 61 had been breaking up. The 20-year-old concrete pavement, only 18 feet wide was becoming dangerous for wider modern vehicles. To rehabilitate the obsolete and dangerous section, the Highway Department spread 4.8 miles of new concrete paving and 2.7 miles of portland-cement-concrete resurfacing to the best possible advantage, under a standard contract with Koss Construction Co. of Des Moines.

Grading, extension of culverts, widening to 22 feet, demolition of old pavement, new paving, and shoulder reconstruction were included in the contract. In spite of its patchwork nature, the road-building venture called for man-sized work items, including about 30,000 cubic yards of grading in rock.

C. & E. M. Photo

Koss Construction Co. uses a special rig to move Blaw-Knox forms ahead on its $521,837 concrete-paving job U. S. 61 in Missouri.

To make it as easy as possible for the contractor, and to facilitate handling traffic, the Highway Department placed detour signs at both ends of the job, and traffic was routed over U. S. 54 and State Route 19 between New London and Bowling Green. Local residents used a temporary dirt road along the highway, and the many rains and hot sunny days while the work was active renewed their acquaintance with mud and dust.

Grading Subcontracted

Grading was subbed to the Hannibal, Mo., firm of L. W. Riney Construction Co., and part of the earthwork was handled by Koss equipment. For the most part it was a tractor-equipment job in earth, and a shovel-truck setup in rock.

Old Pavement Broken

The low bearing value of the old 9-7-9 concrete pavement forced the construction department to order the removal or abandonment of about 4.8 miles. Koss rigged up a heavy drop hammer, mounting it on a Hug truck. The old pavement had a steel reinforcing bar along the edges, and two along the longitudinal joint. In spite of this type of strengthening, it proved to be no match for the powerful drop hammer.

The machine worked in sections approximately 1,000 feet long at one time. Starting at one edge, the breaker broke the 1,000 feet, and then moved back along the same general route until it had broken half the pavement to the center line. It then started to work on the opposite edge and repeated the process until the job was finished. So thoroughly was the pavement demolished when the machine had finished that the Caterpillar DW10's and scrapers had no difficulty in loading the material.

Subgrade Then Strengthened

A generally inadequate bearing foundation under the broken pavement sections was then strengthened. The grade was reshaped and compacted by sheepsfoot rollers where necessary. A new 4-inch crushed-rock base was also installed 24 feet wide, 2 feet wider than the new pavement.

Crushed rock for this base was trucked in by a fleet of rented machines, which hauled from the Galloway Quarry near Frankford, Mo. The subbase rock was dumped along the quarter point, according to volumetric measure. It was later road-mixed by a Caterpillar No. 12 blade, watered, laid down, and rolled by a steel-wheel tandem Huber and a rubber-tire compaction roller.

Where the old pavement was used as a base, a 2-foot widening trench had to be excavated 12 inches deep. The shoulder was first bladed down, and the trench was then cut out by a special blade attached to the moldboard of the No. 12 Caterpillar motor grader. The trench was filled with crushed rock for a depth of 4 inches by an Apsco widening spreader, usually very

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C. & E. M Photo
General Superintendent Al Buerlein is a busy man in the field. Here's proof he also has office work.

close behind the trench cut to reduce the trench exposure to rain. A windrow of dirt, bladed along the edge of the crushed-rock widening strip, furnished the necessary bulwark to back the strip while the Huber roller compacted the rock. Moisture for this strip was added at the widening machine by a small spray jet.

Paving Goes Fast

Koss Construction Co. is well known throughout the midwest as a fast, efficient, paving outfit. Under the supervision of General Superintendent Al Buerlein, the crew hoisted its green flag which denotes its good safety record, and turned on the green light for progressive paving. As much as 2,000 linear feet of 22-foot pavement was soon being placed in a 10-hour shift.

Bulk Universal Atlas cement, from the mills at Hannibal, was sent to a siding at Oakwood by rail. There it was transferred to a 75-barrel Heltzel cement silo, for truck transportation to the 75-barrel Johnson plant at the job. A Johnson aggregate batcher, with 60 and 80-ton bins, was also used at the plant setup in the center of the paving work.

Concrete materials were dry-batched, and trucked to the skip of a Koehring 34-E Twinbatch paver. Mixing water was available in small streams along the highway, and a water tank truck picked up its loads with ease, simply by turning on a small gasoline-driven centrifugal pump. A water tank truck at the paver kept that machine supplied.

Machines riding the 8-inch Blaw-Knox steel forms behind the paver included a Jaeger spreader, which made a pass over half the thickness and backed up to allow reinforcing mesh wire, which was used only on the resurfacing portion, to be placed. This reinforcing mesh was installed about 2 inches from the surface.

The finishing machine was a Jaeger Type X diagonal-screed rig. A Koehring Longitudinal Finisher put on the first finish, which was followed by hand floats and finally a pulled-burlap finish. Transverse contraction joints, on 20-foot centers, were cut by a Flex-Plane machine, which also installed the center strip on the resurfacing only.

There was no special difficulty in covering the old pavement with a 5-inch concrete slab, according to Buerlein, and finishing was easy even on many of the superelevated curves in the project.

Although grading and culvert work got under way only after April 1, paving was finished by July 25, in spite of rain and bad weather. When the outfit paved, it paved rapidly. The concrete was cured by Hunt Process Clear membrane solution, and was soon ready for traffic.

The rehabilitation of this 16-mile section of U. S. 61 ties in to a hot-mix resurfacing and widening project below Bowling Green, and is expected to relieve a bad north-south traffic situation on this important interstate highway. By spreading available funds as thin as possible, the Missouri Highway Department hopes to build as well and as far as the people of the state will permit.

Carl W. Brown, Chief Engineer of the Missouri Highway Department, was in general charge of the work. J. J. Corbett was Engineer of Construction, with W. H. McGee as Resident Engineer.

Johnson Western Changes

L. J. Sullivan has been elected President and General Manager of Johnson Western Constructors. He succeeds Elden Smith, who has resigned. Earl Corkett was recently elected Vice President of the company.

Johnson Western is currently building the Magnolia Street Pier, Long Beach, Calif.; the submarine pipeline across the main channel of Los Angeles Harbor; and the Kernville-Isabella Canal for Southern California Edison Co. This last project combines both the general-construction and the Gunite operations of the company.

Building Dams With Cranes

A new 12-page booklet illustrating American Revolver cranes on twelve outstanding dam construction jobs has been prepared by American Hoist & Derrick Co., St. Paul 1, Minn. The photos were taken at Garrison, Friant, Grand Coulee, Bull Shoals, and other dams, and they show American Revolver cranes building trestles, replacing forms, setting steel, and handling concrete. Emphasis is placed on the size, power, and reach of these cranes. The brochure includes rated lifting capacities for the American crane units, available in gasoline, diesel, electric, and steam-powered models.

This literature may be obtained from the company by requesting Catalog No. 400-R-2, or by using the Request Card at page 16. Circle No. 485.

The Nelson Loadall will load sand, snow, gravel, salt, etc., in quantities of 1¾ to 2¼ cubic yards per minute.

All-Purpose Loader

A new all-purpose loader has been introduced by N. P. Nelson Iron Works, Inc., Clifton, N. J. The manufacturer states that the Loadall will handle sand, snow, gravel, coal, cinders, humus, leaves, salt, etc., without belt changes or use of special attachments.

The new machine is designed for the small contractor with year-round truck-loading problems and a limited budget. It travels under its own power at road speeds up to 10 mph with working speeds to 6½ mph. It is said to load heavy materials at from 1¾ to 2¼ cubic yards per minute. The 24-inch spirals have replaceable-tooth digging edges. The unit is powered by a 4-cylinder air-cooled gasoline engine.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 538.

Triple Drafting Aid

A new 3-purpose electric drafting aid is made by Dremel Mfg. Co., 2420 18th St., Racine, Wis. It may be used to erase pencil or ink lines, sharpen pencils and compass leads, and burnish erased areas for clean re-inking.

No interchanging of parts is necessary with this device. The erasing tip is at one end, the burnisher at the other end, and the sanding disk is mounted around the driveshaft. The unit operates on standard 110-volt ac or dc electric current.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 493.

Data on Vibrating Screens

Concentric-action vibrating screens —designed for medium and heavy-duty service, and accurate sizing, rinsing, and dewatering of a wide range of materials—are illustrated, described, tabulated in a new 12-page book, No. 2354, now available from Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.

The CA vibrator mechanism imparts a smooth, positive, circular motion to all screening surfaces, the catalog states. Amplitude of vibration is easily adjusted to eliminate binding caused by sticky clays; to speed removal of fines from stones or chemicals; or to insure sharp separation in sizing, according to the manufacturer. CA vibrating screens are made with surfaces ranging from 3 feet wide x 8 feet long to 6 feet wide x 16 feet long; in single, double, or triple-deck models; and for suspended or floor mounting.

Detailed dimensions, weights, and other engineering layout data are given, including a page on how to select the right size of screen for handling a given capacity of material per hour over square openings up to 3 inches.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 513.

Thor Export Branches

Two export corporations to operate as Thor sales and service branches in western Europe and South America have been organized by Independent Pneumatic Tool Co. Thor Tool Continental, Inc., is in Antwerp, Belgium, and is under the direction of Vance G. Turner. Thor Tool Hemisphere, Inc., is in Sao Paulo, Brazil, with Donald E. Randall as Manager.

New DC Electrodes

Thoriated tungsten is now available as a non-consumable electrode, Thor-Tung, for dc straight-polarity Heliwelding, Airco's inert-gas-shielded arc-welding process, according to an announcement by Air Reduction, 60 E. 42nd St., New York 17, N. Y.

Tests have shown that Thor-Tung operates much cooler than standard tungsten electrodes, thus permitting the use of higher currents on given sizes of electrodes, Airco claims. Arc stability over a range of currents is also claimed.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 450.

Tractor-Mounted Saw

A 4-page folder describing a tractor-mounted saw driven by a power take-off has been prepared by Harry Ferguson, Inc., Detroit 11, Mich. This portable power saw carries a 30-inch blade which travels at a normal speed of 1,200 rpm. The literature includes a complete description of the unit, its specifications, and field photos.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 480.

The Neo-Flasher will run on a single 6-volt battery for 1,200 hours. It produces a sharp red flash at ½-second intervals. Two models are available.

New Danger Signal For Vehicle or Road

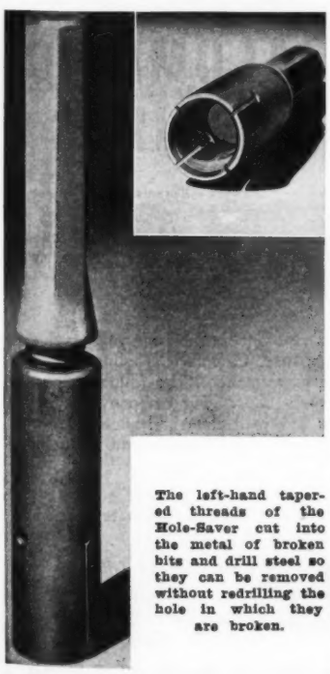
A new flashing danger signal for use on trucks or other equipment, construction jobs, or danger stops on the highway, has been developed by Light Products, Inc., 407C Commercial Center, Beverly Hills, Calif. The company claims that its new type of circuit interrupter enables use of the flasher for 1,200 hours on a single 6-volt battery. The new light, called the Neo-Flasher, is said to be waterproof, vaporproof, shock-resistant, lightweight, and to produce a brilliant red flash at ½-second intervals.

This danger signal is available in two models. One has a 360-degree plastic lens which casts a warning light in all directions which can be seen for more than 2,500 feet. The other has a 5-inch directional reflector head which is visible for 2 miles, the company says. To prevent theft, specially constructed clips are available so that the light may be locked onto a truck, barricade, or any other object where warning illumination is desired.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 439.

Device Saves Bits And Hole Redrilling

The new Hole-Saver developed by Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25, Pa., is used to reclaim lost bits and drill steel broken off in the hole, and save redrilling. Attached to a threaded steel in place of a bit, its peculiar left-hand tapered threads cut into the metal of the broken rod and remove it quickly, easily, and without jamming, according to the manufacturer. The tool is threaded for Timken H or D and Rock Bit R-1 or R-2 steel to fit the following sizes of steels—⅞ and 1-inch hexagonal and quarter octagonal, and 1⅛ and 1¼-inch round. The manufacturer claims that the Hole-Saver has been field-proved and rigorously tested.



The left-hand tapered threads of the Hole-Saver cut into the metal of broken bits and drill steel so they can be removed without redrilling the hole in which they are broken.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 520.

Jander Heads Disston Sales

L. W. Jander has succeeded J. F. Wilkinson as Sales Manager of the Industrial Division of Henry Disston & Sons, Inc., manufacturer of saws, tools, files, and special steels. Since 1947, Jander has been in charge of the company's Eastern Sales Division. Wilkinson has resigned to enter his own industrial distributing business in Miami, Fla.

Two Snowsheds Built On Snoqualmie Pass

Rock Slides and Short Time Worry Contractors; Sheds Will Protect Motorists in Dangerous Slide Zones

By RAYMOND P. DAY,
Western Editor

(Photo on page 1)

• TWO reinforced-concrete snowsheds, placed at the most dangerous permanent slide zones on U. S. 10 at Snoqualmie Pass, comprise the Washington Department of Highways' answer to a problem that has been troublesome for years. The Department is spending approximately $1,250,000 to have the sheds constructed. C. V. Wilder Co. and Gaasland Co., Inc., of Bellingham, Wash., hold the F-A contract under a joint-venture bid.

The snowsheds when completed will carry traffic safely through 1,300 feet of a dangerous slide area at Airplane Curve, on the west side of the pass, while travel through 500 feet of another vulnerable slide area will be assured at Lake Keechelus, on the eastern slope of Snoqualmie Pass. Both sheds are located on grades and curves, making construction somewhat difficult. The Airplane Curve shed is set on a 4,000-foot radius, while the Lake Keechelus shed has a 2,000-foot radius.

C. & E. M. Photo

It was bitterly cold, and an early-winter snowstorm was roaring over Snoqualmie Pass when C&E Monthly took this overall photo of the Lake Keechelus snowshed. Workmen are waterproofing the roof between the prefabbed concrete sections.

Rock slides, bad weather, and other delays hindered excavation work, and grading that began in March was several months getting out of the way. Actual work on the concrete placing did not begin until September 15, but since that time Wilder-Gaasland's operations have gone ahead rapidly, with 250 cubic yard days the rule, despite thin walls and counterforted sections.

Both Snowsheds Smaller

Both snowsheds are similarly designed. The Airplane Curve structure is on the south side of the highway, while the other is opposite hand. The sheds consist of a series of 100-foot sections, capable of carrying two lanes of cars. Dug back against the mountainsides, the sheds will normally not carry summer traffic.

The front face of each shed consists of a series of columns, 2 feet square on 20-foot centers, connected by a 1-foot arch beam. This beam is 3 feet 4 inches deep over the columns, and

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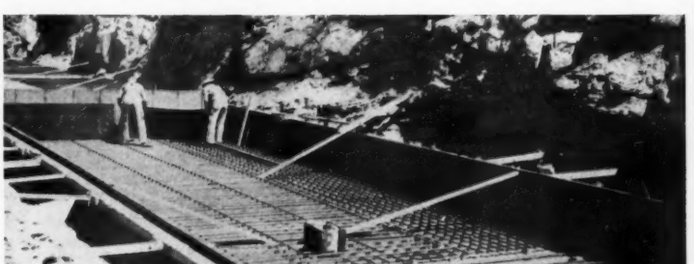
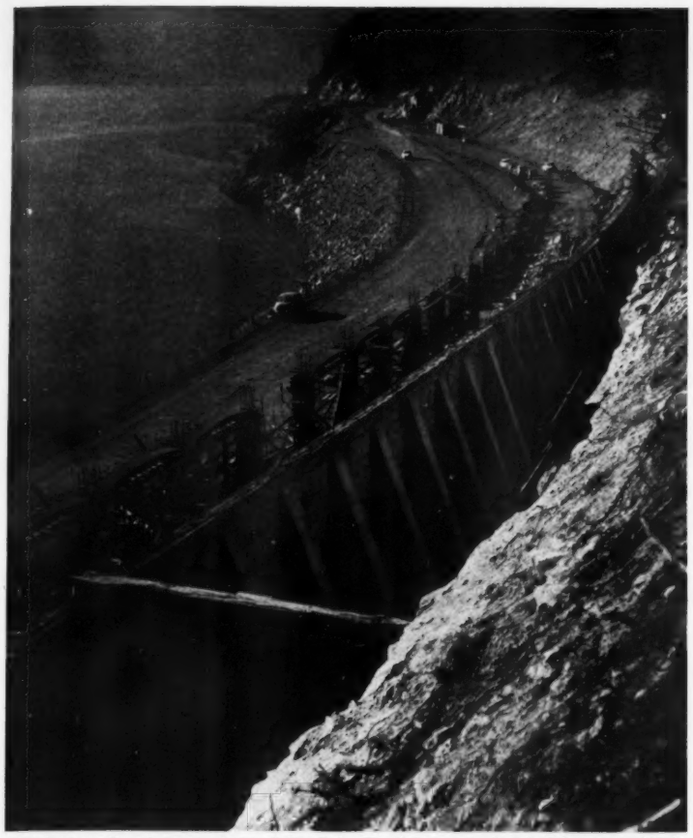


Photo Courtesy of E V. Shields

Steel and Uni-Forms in place in a snowshed footing.



The back wall and counterforts of the Lake Keechelus snowshed had been completed when this picture was taken. The wall consists of a 15-inch continuous section, strengthened by counterforts 2 feet wide on approximate 10-foot centers.

2 feet 4 inches in the center between columns.

The back wall consists of a 15-inch continuous section, strengthened by heavy counterforted walls 2 feet wide on approximate 10-foot centers. These counterforts taper from a width of 12 feet at the base to the meeting point at the top of the wall.

Connecting the front and back walls is a sloping concrete roof, consisting of prefabricated sections of beam and slab. So critical was the completion time that the prefabrication and delivery of these sections was subbed to Seattle Concrete Pipe Co. Beams on the roof sections are approximately 2 feet 6 inches wide and 2 feet 2 inches deep. The slab part of each roof section is 5 inches thick and reinforced to stand up under heavy slide loads of snow, dirt, and rock. The space between each roof section is waterproofed with a 3-layer seal, consisting of an asphalt strip, a cement-grout pour, and a cold mastic seal over the top.

Excavation

Excavation at Airplane Curve was mostly a shovel job without explosives, but at Lake Keechelus a solid wall of rock had to be drilled and shot. Two shovel spreads were employed. A 2-yard Manitowoc shovel with three Tournarockers moved muck from one zone, while five 7-yard trucks and a 2-yard Northwest shovel worked at the other spot. Several wagon drills and jackhammers, with drill steel up to 30 feet long, preceded the shovels.

During the drilling, shooting, and hauling, traffic was routed through the job with the aid of flagmen. Muck was used to build a main outer highway embankment beyond the snowsheds.

The Fight for Concrete

One of the hardest things about the project was the series of delays which slowed the start of concrete work far beyond what had been expected. Major and minor slides, bad weather, and practically every other conceivable kind of delay hindered the start of concrete work. On September 5, only five days before concrete was scheduled to begin, a large rock slide came down, ripping out erected forms and delaying the work 10 days more.

Thus when concreting finally did get under way, and continued day after day at a high rate of speed, both the contractor's and engineer's crews were proud of the accomplishment.

General Superintendent E. V. Shields introduced the use of Uni-Forms to this project, the first in the Pacific northwest in his experience to use the patented panels. Uni-Forms were used on everything: footings, columns, walls. Two-foot panels were used in 4 and 8-foot lengths. The high back wall and counterforts, formed monolithically, were made up in 100-foot sections, and after a pour was made the sections were quickly dismantled and moved ahead to the next pour. By making one short 20-foot starting section, Shields carried the remaining 100-foot panels on a straight grade in rectangular form sections.

Dry-batched concrete material was proportioned by a Noble batcher, set up halfway between the two sheds. The batch trucks dumped to a Mixer-mobile, equipped with a 55-foot tower. This permitted the air-entrained concrete to be hoisted high enough so the disposal of the material could be controlled entirely by chutes. No auxiliary

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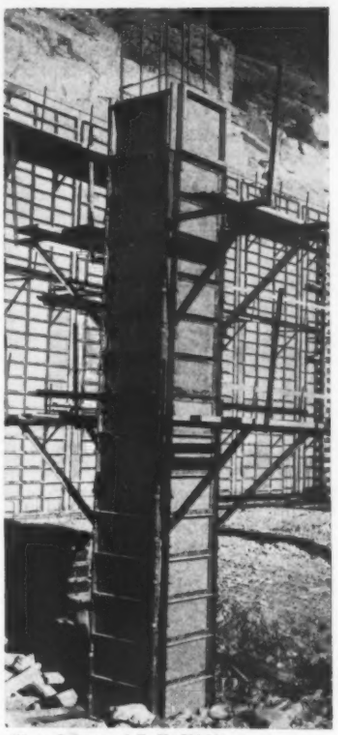
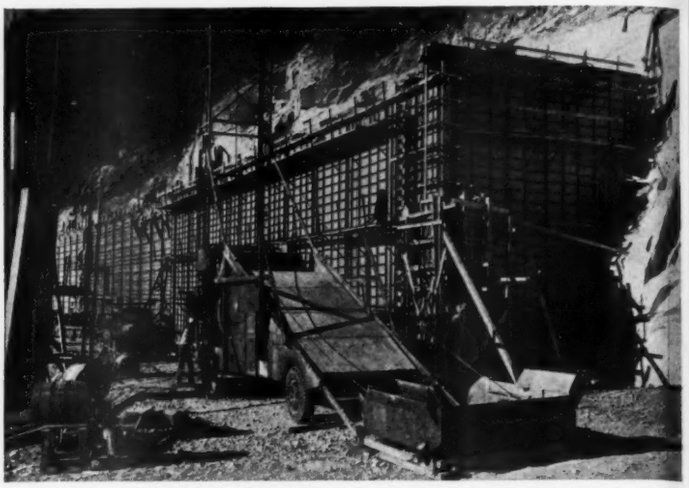


Photo Courtesy of E. V. Shields

Uni-Forms are here shown in place for snowshed column pours.



Three sets of Uni-Forms, enough to form three 100-foot sections of retaining-wall pads, plus three sets for the retaining wall proper of the snowshed, were used to give a smooth cycle of forming, pouring, and stripping (illustrated in photo left). Special steel corners and Uni-Form panels were made to handle the forming at counterforts. A Mixermobile hoisted the concrete (photo at right).

Two Snowsheds Built On Snoqualmie Pass

(*Continued from preceding page*)

hoisting equipment was employed, other than the Mixermobile.

The concrete work will also include placement of a floor slab, set on a sand subbase. Floor concrete will also be mixed and placed by the Mixermobile, and rodded and broom-finished by usual highway construction methods. The floor slabs will not be placed until after the prefabbed roof sections have been craned into position.

An early winter, reminiscent of those the past two years, had set in by mid-November, and Shields was undecided whether to fight the sheds through to a finish or hold off on some of the floor slabs until spring. On November 13 a blinding snowstorm whistled in, promising to help Shields make his decision. Both sheds were sufficiently complete to give motorists some protection if bad slides create enough of an emergency to route traffic through the new buildings.

Personnel

Shields was assisted on excavation by Sam Lowry, while Mac McDaniels was Project Engineer, and Millard Smith was Carpenter Foreman. Charles Chapman represented the Department of Highways as Resident Engineer, working under the supervision of Tom Doyle, District Engineer at Yakima. The snowshed structures were designed by the Department of Highways under the direction of W. A. Bugge, Director of Highways, and George Stevens, Bridge Engineer.

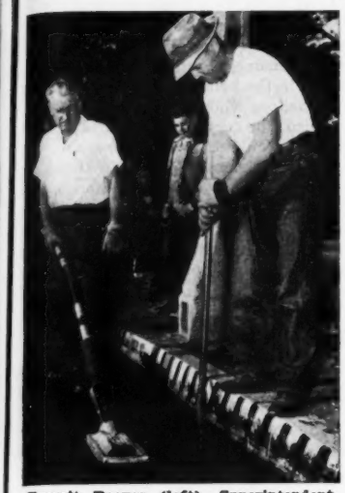
New Safety Goggle

A new all-plastic safety goggle has been developed by United States Safety Service Co., Kansas City 6, Mo. The one-piece plastic lens is removable and interchangeable; it furnishes two types of eye protection since it will fit both the new Saf-I-Duo and the Saf-I-Spec, an all-plastic safety spectacle.

The one-piece interchangeable lens is made from optilite, a new optical safety plastic which meets government specifications for optical qualities and impact resistance. The lens is available in clear or antiglare green.

The goggle frame is firm, the company says, yet pliable enough to effect a tight seal against the face, offering full protection from acid splashes, dusts, flying objects, etc. It will fit over personal glasses, and four types of ventilation are available to meet all needs.

Further information may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 498.



Everett Reeves (left), Superintendent of Streets, San Fernando, Calif., demonstrates the Surfa-slick asphalt-smoothing iron. It heats itself.

ing spatter; and a slagging pick which permits pin-point removal of slag from weld pockets and corners. The latter is also a scraping tool for removing slag from edges of welds. The handle is balanced to reduce worker fatigue.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 448.

Circular on Highway Signs

Literature on highway signs and traffic devices is offered by Miro-Flex Co., 1824 E. Second St., Wichita, Kans. It illustrates the company's embossed traffic signs, explains that they are of steel construction with a baked-enamel finish. Standard sizes 24 x 24, 18 x 24, and 12 x 18 inches are available in all designs—square, diamond, circular, and octagonal. The literature also lists the standard word designations which appear on the signs.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 526.

Paul Gilmore & Sons, Spartanburg, S. C., speeds the handling of stone from cars to trucks with a Haiss Model 501 heavy-duty chain and belt undercar unloader and a Haiss Model 482 trough belt conveyor.

A New Self-Heating Road-Smoothing Iron

A new self-heating asphalt-smoothing iron has been developed by J. E. Woods Mfg. Co., 1516 First St., San Fernando, Calif. The Surfa-slick is said to use only a dime's worth of gasoline for all-day operation. According to the manufacturer, the tool has no complicated parts, doesn't require experience to operate, and can be used for all purposes to which standard irons are put.

The shoe on this new iron can easily be replaced when worn, the company says. The Surfa-slick weighs about 40 pounds, has a knurled handle for angle leverage, and is fitted with sharp edges for cutting asphalt joints.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 502.

New Portable Heater

A new portable heater for cold-weather construction has been developed by The Portable Heater Co., 814 Engineers Bldg., Cleveland, Ohio. It is said to be capable of raising the temperature of a room from 30 to 80 degrees within 20 minutes—without odor, fumes, grease, or smoke. The unit weighs 55 pounds and burns concentrated fuel—hot-test bottled gas—held under pressure in a 20-pound cylinder.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 549.

New Scaling Hammer

A scaling hammer has been introduced by the newly organized firm of Jack Churchward Welding Accessories, North Haven, Conn. Features claimed for it are a multi-point hammering surface which speeds descaling; a hollow-ground head effective for remov-

A multi-point hammering surface, hollow-ground head, and a slagging pick mark the Churchward scaling hammer.

Distributor Doings

Cox Underwrites Operator Training

• BY financing an operator-training program in cooperation with a Seattle labor union, A. H. Cox & Co. of that city has overcome contractor objection to powered concrete carts and boosted its sales of the machines. The Cox equipment - distributing organization handles Gar-Bro Power Carts, and today the area around Seattle is full of skilled operators because of two chance remarks.

"Who will we get to run these things?" asked the contractors when equipment salesmen pushed the powered equipment. Jim Cowan of the Cox firm as quickly responded "We'll train them for you."

For a period of many months the business agent of the engineers' local assigned six different men each Saturday to the training program. The men reported to the big equipment yard of Rental Machinery Co., a Cox subsidiary. There they were taught the operation, maintenance, and production features of the Power Carts. Lessons began with easy instruction on how to start the machines, but the course consisted mostly of actual operation under simulated job conditions. Stop lines, marked courses, and dump points were painted in the yard, and the men were taught how to spot the concrete efficiently and still operate the Power Carts at maximum speed. During rest periods the equipment firm furnished free coffee and doughnuts.

"Most of the men who responded best and learned the most rapidly were young," said John A. Widrig, Executive Vice President of the firm and Manager of Rental Machinery Co. "Some of the boys were 'hot rod' fans, and sometimes the course of instruction degenerated into races. But the boys learned rapidly, and contractors we had to talk hard to had broad smiles on their faces when they saw what the powered equipment could do to cut their labor cost and boost concrete placement figures."

Rescue Work Too

As a matter of fact, ingenuity of this kind is old hat to both the main firm and its subsidiary. The normal course of business for Rental Machinery Co., especially, consists of one emergency after another, 24 hours a day throughout the year.

Recently a large freighter moored at Aberdeen put in a frantic call. It had moored over a protruding piling, and an ebb tide let the pile punch a hole through the ship's hull. In less than 3 hours the boys at Rental Machinery Co. were down at Aberdeen with two 10-inch and two 8-inch pumps, hose, and all the fittings. They saved the ship and earned the gratitude of the steamship line.

Several years ago the steamer "Diamond Knot" sank near Port Townsend, Wash., loaded with a $4,000,000 cargo of canned salmon. Walter MacRae and the Foss Co. called on to salvage the valuable cargo, called in turn on Rental Machinery Co. Heavy-duty pumps were furnished, with welding and cutting equipment to open up the ship's hull. Divers blew open the salmon crates with jets of water under high pressure, and a suction pipe then picked up the canned salmon like a vacuum sweeper. Thanks to equipment that was furnished promptly, a valuable cargo was saved.

So important a business firm to the community is the company and its subsidiary that the Seattle Disaster Commission recently surveyed its resources. Those 75 air compressors with complete air tools; those 60 pumps of all types; those wheelbarrows and Power Carts and hoists and concrete buckets might all come in handy if Seattle is ever attacked.

With rented equipment spread over the entire Pacific northwest and Alaska, the company is hard-pressed to keep it in first-class operating condition. A force of 8 mechanics do nothing but overhaul rented equipment as it drifts back into headquarters. Salesmen are all trained to instruct operators on the various jobs in the operation and maintenance of each machine, so the contractor will get the most from his rented equipment.

"It's one of the best public-relations jobs you can do for your company," these salesmen are told.

Contractors Approve

Contractors like to do business with the firm. Recently a contractor had a rush job to finish an installation for the Aqua Follies at Green Lake. He needed 3-phase power in a hurry. The city and the power company said it would take 3 weeks to bring it in. The contractor called Rental Machinery Co., had a 3-phase generating set delivered on a rental basis that day, and moved ahead to finish his job successfully.

The Cox firm and its subsidiary have stayed out of the shovel-crane-tractor rental business with ironclad determination, in the belief that it competes with contractors who are their customers. It is also the company's belief that it would weaken the contract system. But with the exception of these items, an unusual variety of construction equipment of all types and models is available through the distributor or rental firm. And if something is new enough so there are no operators, the company will make them.

Two N. Y. Dealers for Huber

State Equipment Co., Inc., has taken over for Huber in central and eastern New York and will handle the line from its offices in Albany and Syracuse. The company's present headquarters at Railroad and Dott Avenues in Albany and at 438 E. Brighton Avenue in Syracuse are only temporary. Construction has already begun on a new office and

(*Continued on next page*)

Distributor Doings

(*Continued from preceding page*)

plant at Stop 12 on the Albany-Schenectady Road, and is expected to start soon on new quarters in Syracuse. John L. Fremon is Manager and Ed Gulden is Service Manager in Albany. H. E. Hemingway is Manager, Al Schlosser is Assistant Manager, and Howard Beebe is Service Manager at Syracuse.

Huber has also announced the appointment of Hodge & Hammond, Inc., New York City, as its distributor in the Metropolitan area.

Hyster Visits and Appointments

George E. Bannister, Export Representative for the Hyster Co., recently returned from a 7-month visit to Hyster overseas dealers. While in Sweden, Norway, Finland, Denmark, England, Ireland, Holland, Belgium, Germany, France, Austria, and Italy, Mr. Bannister acted as a consultant on plant modernization and installation of materials-handling equipment.

Hyster also announces that Aichel Steel & Supply Co. of Jacksonville, Fla., will sell and service its material-handling equipment in 8 Florida counties (Gadsen, Liberty, Franklin, Pinellas, Hillsborough, Polk, Osceola, Indian River) and 12 Georgia counties (Chatham, Bryan, Liberty, Long, Wayne, Pierce, Ware, Clinch, Lanier, Lowndes, Brooks, and Thomas).

Curry Takes On Riddell Line

Curry Equipment Corp. is exclusive distributor for W. A. Riddell Corp. Warco motor graders and Hercules road rollers in the Philadelphia territory. Its warehouse and office are at 3132 W. Thompson St., Philadelphia.

Eriez Dealer in Charleston

The Engineering Products Co. of Charleston, W. Va., now handles the full line of magnetic separation equipment made by Eriez Mfg. Co., Erie, Pa.

George Garrett, electrical engineer and former Chief Engineer for E. I. du Pont de Nemours, and Ralph Crump, mechanical engineer, are members of the sales force of the dealer company; F. E. Anderson, chemical engineer, is General Manager. The company will make complete research and laboratory testing facilities available to its customers.

Display Rack for Showrooms

A combination display and literature rack for dealer showrooms has been made available by The Thew Shovel Co., Lorain, Ohio. The top part features a sepia photomontage of on-the-job views of Lorain shovels and cranes. On each side are three glossy prints of Lorain machines at work in the distributor's territory; these are easily replaced as new photos are available. The bottom section has eight glass-faced literature pockets for catalogs, and a cupboard for literature storage.

This new display and literature rack for distributor showrooms is 6½ feet high x 6 feet wide, made of plywood and wallboard, colorfully lacquered and silk-screened.

I-H Deals in Information

The latest service and maintenance information on International Harvester industrial power products is being relayed to the company's district offices and distributor service personnel by two mobile training units. Each unit consists of an International L-180 Series truck with a 32-foot drop-frame enclosed semitrailer especially equipped for both service and sales training.

Two instructors in each unit will present the International product-servicing story with the aid of charts, slide films, and movies. The presentation will be highlighted by the use of cross-sectioned working models of various crawler-tractor components including

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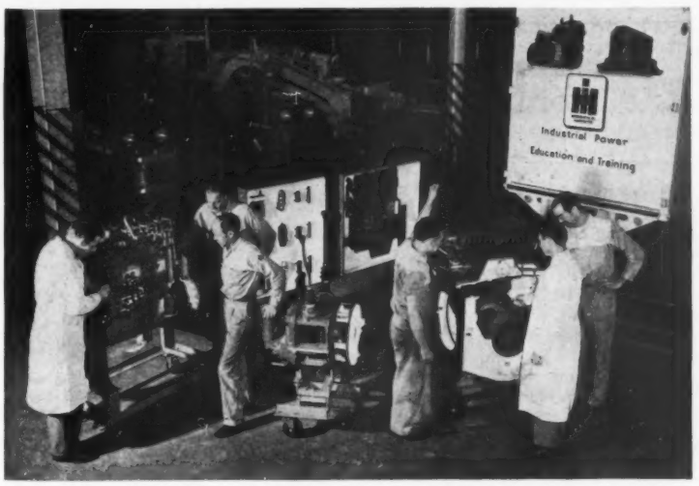

With a cross-section engine, working models, and exhibits removed from the trailer that will carry them around to distributors' offices for demonstration, instructors work with small groups of service personnel to tell the International Harvester product-servicing story. An International L-180 Series truck transports the exhibit.

Distributor Doings

(Continued from preceding page)

transmissions, hydraulic units, final drives, diesel engines, tractor rollers, and steering clutches, plus a complete fuel-injection-system laboratory. All cutaway models are caster-mounted so they can be removed from the trailer.

I-H distributors plan to invite interested contractors, operators, and service organziations when the training program is presented at their home offices.

A complete self-contained training center is this GMC 650 diesel truck, one of the four that is traveling throughout the nation to set up one-week GMC diesel truck-service training schools. Here, two instructors check equipment before loading.

Named to New York Sales Staff

Hubbard & Floyd, Inc., of New York City, has appointed Chris Olsen to its sales staff to cover Westchester, Orange, Rockland, Putnam, Dutchess, and Ulster Counties of New York.

Service Training for GMC Dealers

Some 1,500 mechanics from 1,000 General Motors Corp. dealer points will be trained in GMC diesel truck service by the end of 1951. That, at least, is the goal of the new GMC training program launched in December. Factory instructors, using mobile diesel service-training units, will remain in some cities for several weeks to run all the courses necessary for the large number of mechanics anticipated.

The course lasts five days and groups are limited to 12 students. Each student works on live engines while being taught construction, operation, maintenance, and overhaul of engine units as used in GMC diesel-powered trucks. Cutaway engines, working models, engine subassemblies, special tools, and other necessary training equipment are carried with each mobile unit to provide a complete self-contained training center.

Leland for Thew in Oklahoma

Leland Equipment Co. has been named by The Thew Shovel Co. as its distributor in all of Oklahoma except Ottowa County. Through its office in Tulsa and its branch in Oklahoma City, it will handle all sales, service, and parts for the Thew line of Lorain power shovels and cranes. The Longview, Texas, branch, which carries Leland truck and trailer bodies, will not handle the Lorain line.

Three Will Handle Heiliners

The Heil Co. of Milwaukee has named three new distributors for its Heiliners: Wolverine Tractor & Equipment Co., Inc., Detroit, Mich., a 6-year-old distributor with a branch at Grand Rapids, Mich.; J. W. Kerns Farm & Industrial Equipment, Klamath Falls, Oreg., a firm that was founded in 1921; and Hampton Roads Tractor & Equipment Co. of Norfolk, Va., started in 1941.

Takes on Concrete-Breaker Account

The Tractor Sales Corp. of Los Angeles has taken on the Hurst-Lewis concrete breaker account from Concrete Sawing Equipment Co., Inc., Pasadena.

American Named in Northwest Area

The American Machine Co. of Spokane, Wash., has succeeded Western Machinery Co. as Koehring representative in eastern Washington and northern Idaho. It will also handle the products of the three Koehring subsidiaries —C. S. Johnson, Kwik-Mix, and Parsons Cos.

Peter A. Briggs is President of American; Henry A. Briggs is Vice President; and F. H. Etter is Secretary and Sales Manager.

FWD Distributor for Pennsylvania

The Four Wheel Drive Auto Co. has appointed FWD Trucks & Equipment Co. of Harrisburg its distributor for the entire state of Pennsylvania. The new company has established its sales and service headquarters at 147 Cameron St. L. H. Jones owns it; he is FWD's distributor for West Virginia.

Takes on Fairbanks-Morse Line

Stillwell Supply Corp. of Long Island City, N. Y., writes that it has been appointed a distributor for Fairbanks-Morse generators and other products. The company handles tarps, electric and pneumatic tools, concrete chutes, hoppers, buckets, hoists, and a variety of other construction equipment.

Watts for Wickwire Spencer

L. A. Watts is now Assistant General Sales Manager of the Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corp. He is succeeded as Manager of the Wire Products Sales Department by R. M. Wagner, but will continue to supervise the Pig Iron and Semifinished Sales Department. Mr. Watts will be located in the corporation's executive offices at 500 Fifth Ave., New York 18, N. Y.

Export Manager for Riddell

Richard J. Kennedy is now Export Manager for W. A. Riddell Corp., Bucyrus, Ohio. Foreign distributors of Warco motor graders and Hercules road rollers will work directly with Mr. Kennedy.

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ow Contractors Can Mobilize for the Future

(*Continued from page 3*)

l' and 'nonessential' projects. To eep their organizations operative, con- actors must emphasize a policy of exibility which will permit them to ek work in the fields of 'essential' onstruction whenever their present reas of operations are threatened by estrictions. The contractor who plans head will be able to make the change ore successfully than the one who aits until it is forced upon him.

"By the same token, contractors who re now engaged almost exclusively in he fields of 'essential' construction ust be prepared to expect increasing ompetition. Until the construction arket broadens out again, the indus- ry will have capacity to spare and here will be relatively more contrac- tors bidding for the work available."

Manpower

There has been considerable discussion of expected labor shortages and of the overtime costs they would involve, but the critical question of supervisory personnel must not be forgotten, cautioned Admiral Cotter. As the second point in his program, he advised contractors to plan in advance against a drain on supervisory personnel as more and more men are absorbed into the armed forces.

"Within almost every organization, there are men assigned to one phase of work who are qualified by experience or can be easily trained to handle a wide variety of projects. Similarly, a number of veteran construction men who are now in retirement may have to be recalled. Ability to tap these rich veins as needed can help contractors keep their organizations functioning and even help them extend their scope of operations."

Material

Admiral Cotter suggested also that contractors, "in cooperation with labor, place double emphasis on conservation of material and, in cooperation with project architects and engineers, seek approved methods of substituting other types of construction materials for those items in critically short supply. . . .

"Industry-wide cooperation to save critical materials by the substitution of others was practiced effectively during World War II, and it can [be] again. The engineers and architects are, of course, the final arbiters on such questions, but contractors can help through recommendations based on their own experiences."

Maintenance

As his fourth point, Admiral Cotter urged contractors to work to minimize maintenance problems by encouraging in every way possible the standardization of equipment and parts.

"We are heading into a period where unit replacements are going to be increasingly difficult," he said. "As was pointed out at the American Standards Association Conference held in New York . . . [late last year] our country's productive capacity will be vastly increased if interchangeability of equipment and parts is accelerated."

Management

As his fifth and final point, he suggested that each contractor "can serve himself, the industry, and the national effort to best advantage if he approaches present and future management problems with full realization that they are an inseparable part of a long and grim program that is going to make exacting demands on every segment of the American economy."

As an example of what he meant, Admiral Cotter cited his own experience during World War II. Before his assignment to the Pacific area, he served for a time as Superintending Civil Engineer of an area covering five southern states. "The character and scope of some of our construction projects," he said, "called for combinations of skills not available in any one contracting organization. To accomplish projects of such nature our procedure was to invite a number of contractors to a conference and reach an arrangement under which they all worked as a single team, with each supplying complementary forces and equipment to solve what until then had been a jigsaw puzzle."

Capacity of the Industry

This ability to meet problems as they arise makes it ill-advised to talk in terms of the "capacity" of the construction industry, Admiral Cotter said. Dollar volume is certainly no yardstick. As of right now, there is throughout the United States a total backlog of more than $50,000,000,000 in construction of all types that has been proposed but never put in work. Roughly $33,000,000,000 of it represents public-works projects; the balance, private construction.

Summarizing a 39-city survey on the problem of material shortages, the Department of Commerce said recently: "This survey tends to show that the productive capacity of building-materials producers is just about in balance with the civilian construction program at its present tempo. It also seems to prove that whatever the magnitude of military requirements, in order to supply it without increased facilities, the civilian program will have to be cut back by just such an amount."

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How Contractors Can Mobilize for the Future

(Continued from preceding page)

There is a growing conviction, said Admiral Cotter, "that to continue to cut back on nonmilitary construction will prove economic suicide in the long run. By the most conservative estimate of Harvard economist Sumner Slichter, U. S. productive capacity must be expanded by 25 per cent within the next five years if we are to maintain our present position of industrial leadership.

"The means of achieving any such goal with the manpower available is, of course, a subject for considerable speculation. Secretary of Labor Maurice Tobin, for example, told the National Conference on Labor Legislation on November 29 that the Government will lengthen the 40-hour straight-time work week if full-scale war production proves necessary, but that such action was not yet regarded as required. He pointed out, on that score, that a one-hour increase in the work week would be equivalent to adding 400,000 workers to the country's labor force.

"Whatever the final decision, how fast and how well the United States will be able to produce the facilities for an expansion of America's productive capacity is going to depend in good part on the construction industry. Given the chance, the construction industry can do it—but only if each contractor takes steps to husband his resources to meet the test."

Rocks on Site Force Change in Foundation

When you have a problem on a construction job, nine times out of ten it's the foundation. That's an old axiom in the building game. The three-story warehouse being built by Gotham Construction Corp. in the heart of New York City is no exception.

The structure was built in three sections with the side elevation stepped because of the steep slope of the ground —a 5½ per cent grade running east and west along 58th and 59th Streets. The first floor which faces on 11th Avenue is 16 feet high and cuts into the natural ground surface 200 feet from the street front. The second floor, 12 feet high, runs back another 200 feet into the hill. The third floor is 12 feet high and runs the full length of the building, 500 feet. Total floor area will be 190,000 square feet.

Original plans were to support the structure on 190 pile clusters of four piles each. It didn't take too much driving before the contractor saw that this was not going to be done easily. There were boulders all over the place. It turned out that the site had been formerly occupied by three huge gas-storage tanks: one of them was 100 feet in diameter, and two of them, supported on masonry walls 2 to 4 feet thick, were 167 feet in diameter and 30 feet deep. When these were removed some twenty years ago, they left three gaping holes which were filled with material brought from nearby subway excavations. The backfill included everything in sizes from stone chips to 15-ton rock slabs.

The contractor saw that every time an obstruction was encountered during pile driving the pile would have to be pulled and an open pit dug and sheeted. In many spots this would mean going down 40 or 50 feet to bedrock with open pits. Job Superintendent Jean San Pietro suggested excavating the entire area formerly covered by the tanks, driving the piles 12 to 14 feet farther, erecting piers in the open, and then backfilling with sand and gravel. Where bedrock was close or where there were further obstructions, pits were dug. There was no problem here, though, since firm footing was down only another 12 or 14 feet. Though it was necessary to excavate an additional 20,000 yards and backfill with purchased material, the method saved a considerable amount of money.

There was another point of interest on this job. Mechanized concrete buggies were used for the floor slab pours. It was the first time that Whiteman Power Buggies had been used in New York City. Four served on this job and enabled pours at the rate of 300 cubic yards per day. Fourteen or more push buggies would have been required to equal such a rate. This is another indication of how increased mechanization of equipment is helping to keep prices low in spite of increased materials cost.

Frank S. Parker Associates, Architectural Engineers, represented the owner, Cecile T. Brinn. D'Aquila Brothers of New York City held the subcontract on the excavation, and Barnaby Concrete Corp., New York, N. Y., the subcontract on concrete work.

C. & E. M. Photo

Three Whiteman Power Buggies come down a ramp for loading on the Gotham warehouse job in the heart of New York City—one returns to a floor-slab pour with its ¼-yard load. In the foreground is a steel-bending table.

Plans to Recommend Standard Safety Practices for Builders

The National Constructors Association has been reviewing the safety practices of some 20 large member engineering and building firms with a view to recommending standard safety procedures in erecting chemical plants, oil refineries, and steel mills. The nation-wide program is aimed specifically at reducing the frequency and severity of lost-time accidents on jobs.

F. R. Griffin, Safety Engineer for the Engineering and Construction Division of Koppers Co., Inc., Pittsburgh, is Chairman of the Association's Safety Committee. The Committee is working with the cooperation of the Construction Section of the National Safety Council.

Safety on the Job With Portable "Lung"

A portable "automatic-breathing instrument" for victims of drowning, electric shock, poisonous or suffocating gases, or any kind of asphyxiation, has been developed by Mine Safety Appliances Co., Braddock, Thomas, and Meade Sts., Pittsburgh, Pa.

Called the Pneolator, it consists of a rubber and plastic facepiece with one valve administering oxygen with positive pressure at regular intervals, cycling automatically, and another stopping the flow on exhalation. The valves are arranged so they interchange automatically, depending upon whether or not the victim is breathing.

Medical authorities agree that manual artificial respiration should be applied immediately on victims of asphyxiation. But the company points out that when the apparatus arrives, it will perform artificial respiration automatically and more efficiently than the manual method.

The instrument can be operated by anyone with first-aid training, after a short instruction course. The unit is packed, ready to use, in a Fiberglas carrying case. In the case is a 22-cubic-foot tank of oxygen, approximately enough for a half hour's use. The main valve connections are arranged to permit attachment of additional oxygen supply from any outside source without disconnecting the regular tank. The entire assembly, with case, weighs approximately 41 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 457.

New Line of Valves

A new line of valves for actuating air or hydraulic cylinders has been introduced by Ledeen Mfg. Co., 1602 S. San Pedro St., Los Angeles 15, Calif. The valves embody rotating-disk construction and are made in three types: for hand operation, foot operation, and finger or solenoid operation. They are available in 14 models for 5 different cycles in 6 sizes, and may be used for controlling the flow of air, oil, or water.

The hand-operated valves turn 45 degrees each way from neutral, a total of 90 degrees. The foot-operated valves turn 15 degrees each way from neutral, or 30 degrees total. The finger or solenoid-operated valves are actuated by two simple poppets which are depressed about ⅛ inch by light finger touch. Two small solenoids are required to actuate the poppets and require only momentary energizing.

Further information may be secured from the company by requesting Bulletin 510. Or use the Request Card at page 16. Circle No. 523.

Broadside on Power Shift

A broadside on the Spring-Flex power shift, available with three types of power actuation, has been prepared by The Timken-Detroit Axle Co., Detroit 32, Mich. The shift enables the driver to use the most suitable axle-gear combination to meet any speed, load, or road condition instantly and effortlessly, the bulletin explains.

A choice may be made between compressed-air, vacuum, or electric units to meet individual requirements. The vacuum power units are available in either single-line or double-line types. The bulletin points out that although the power unit itself is different in design and construction with the different systems, there is no difference in the method of operation in so far as driving the vehicle is concerned. Control is exercised by the flexible predetermined force of the spring built into the shifting mechanism.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 415.

Base and surface material for Malton Airport in Toronto were prepared by King Paving Co., Oakville, Ontario, in this Pioneer Continuflo Model 101 continuous-process asphalt plant.

Concrete Patching, Iowa Style

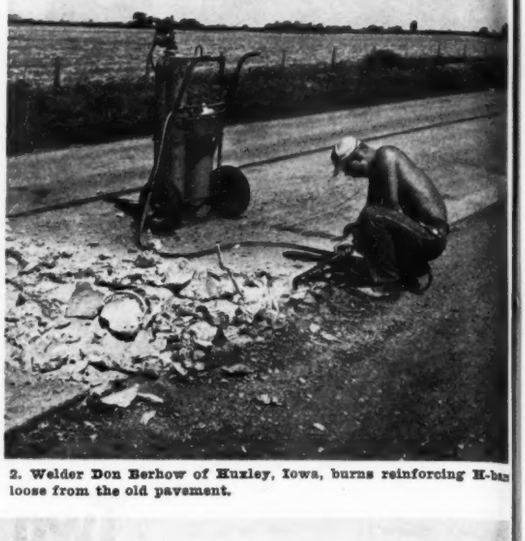
By RAYMOND P. DAY,
Western Editor

• WHEN the expansion joints of a concrete highway break down, what's the best patching method? Can a maintenance crew develop speed on such work? What does patching cost per square yard? Can you load the broken concrete mechanically and still let traffic by? Latest techniques of the Iowa State Highway Commission, recorded in this picture sequence, give the answers. And Iowa's opinion—because it has been traditionally a "concrete state"—should carry weight.

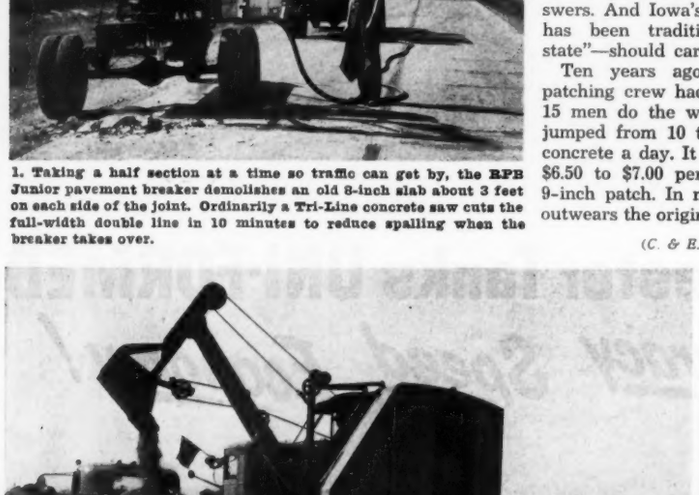
Ten years ago an average Iowa patching crew had 22 men. Now only 15 men do the work, and output has jumped from 10 to 50 cubic yards of concrete a day. It costs the State from $6.50 to $7.00 per square yard for a 9-inch patch. In most cases the patch outwears the original jointed pavement.

(*C. & E. M. Photos*)

1. Taking a half section at a time so traffic can get by, the RPB Junior pavement breaker demolishes an old 8-inch slab about 3 feet on each side of the joint. Ordinarily a Tri-Line concrete saw cuts the full-width double line in 10 minutes to reduce spalling when the breaker takes over.



2. Welder Don Berhow of Huxley, Iowa, burns reinforcing H-bars loose from the old pavement.



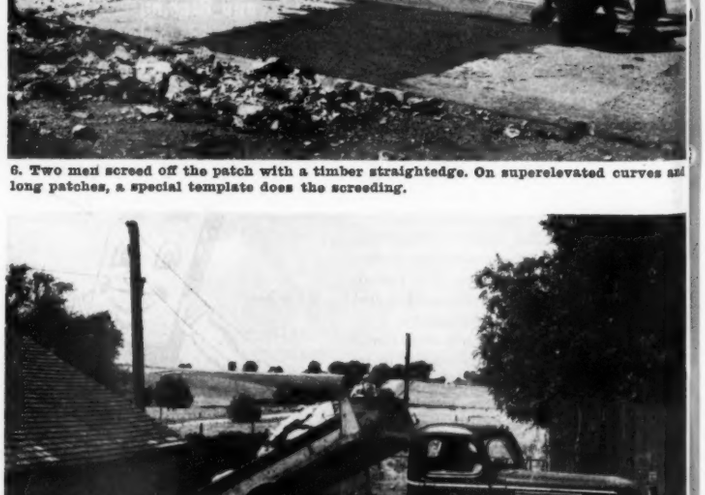
3. A Schield Bantam backdigger with a 30-inch-wide bucket loads broken concrete to dump trucks. Its short boom lets it work in one lane while traffic passes in the other. Any material remaining is hand-shoveled and jackhammered clean.

4. The patch area, now cleaned down to the base and formed with 2-inch staked plank is filled from a Jaeger truck mixer from Ames Lumber Co. A special 8.33-sack mix is used so the concrete can be traveled over in 24 hours.

5. A Marvel vibrator consolidates the mass as Foreman A. M. Ruggles of Ames, Iowa (at the extreme left) looks on.

6. Two men screed off the patch with a timber straightedge. On superelevated curves and long patches, a special template does the screeding.

7. Workmen now put on a final wood-trowel finish. Wet burlap and a clear membrane will cure the patch; later the matching crack will be sealed and waterproofed with oil.



8. The broken concrete is dumped in hog-feeding lots where it makes an excellent base. Truckloads also find their way into farmer's ditches for erosion prevention.

Win LeTourneau's Oldest-Tire Contest

The oldest tire in the Tournapull division of the "Oldest-Tire Contest" sponsored by R. G. LeTourneau, Inc., Peoria, Ill., is a drive tire on a rig in use 10,750 hours and now being operated by Kenneth Webster of Arima, Trinidad. The winning entry in the Carryall division is a rear tire in use 25,000 hours, mounted on a scraper operated by Vince Murphy of Canton, Ohio.

The tire which won the prize for Webster is mounted on a Super C Tournapull which was purchased and put to work in February, 1945. Previously owned by Contractor Summer & Sumkins, it is now owned by the Works and Hydraulics Department, Caura, Trinidad, and is moving dirt and boulders on Caura Dam.

Murphy's prize-winning Carryall tire is mounted on a Model RU scraper which was purchased and put to work in May, 1941. Present owner of the machine is Hunkin & Conkey Construction Co. It is being used on a Pennsylvania Railroad relocation at Bowerston, Ohio, and has previously worked on a railroad relocation at Blairsville, Pa.; during World War II it did coal stripping at Charleston, W. Va. Both tires are Firestone. Webster's is a 21.00 x 24, and Murphy's is a 24 x 32.

All entrants in the contest were required to send in photographs of tires whose work records they entered. Statements on the number of hours worked were based on information obtained from the contractor or owner of the machine on which the tires were mounted.

The oldest Tournapull and Carryall tires on record—and operators Kenneth Webster of Trinidad and Vince Murphy of Ohio.

Gasoline-Hammer Catalog

A new catalog on Syntron self-contained gasoline hammers for use as paving breakers, rock drills, or spike drivers has been offered by Syntron Co., 227 Lexington, Homer City, Pa. The new Model 51 hammers feature an electric governor designed to provide maximum blow automatically with the throttle open, a new heavier piston, fan ventilation, and throttle control of power. Cutaway photographs illustrate the construction and operating features of the hammers. The folder points out that the Model PB-51 paving breaker may be used with a wide variety of tools, all with 1⅛ x 6-inch hexagonal shanks.

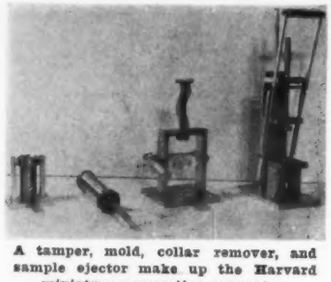
The principle of operation of the RD-51 gasoline-hammer rock drill is essentially the same as that of the paving breaker, the folder says. It differs in that a spirally splined striking piston converts a fraction of the explosive linear power into a steady, high-torque rotation of the drill bit. This drill-bit rotation, combined with 2,000 blows per minute, provides high-speed drilling in rock, the literature says.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 462.

Portable Steel Buildings

A new catalog on the Ideco portable and sectional steel buildings for "comfortable and convenient tropical camp quarters" has been prepared by International Derrick & Equipment Co., 1315 Pacific Ave., Dallas, Texas. It points out all construction and application features of these units, which are designed for exploration parties, construction gangs, drilling crews, etc., working in tropical or subtropical climates. The literature claims that these quarters are comfortable, economical, easily moved, and readily altered. Illustrations show exterior and interior views. Complete designs and specifications, and suggested plans for erecting and transporting, are also included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 431.



A tamper, mold, collar remover, and sample ejector make up the Harvard miniature compaction apparatus.

Compaction Tester

A new small-sized unit for testing soil compaction, developed at Harvard University, is available from Soil Testing Services, Inc., 525 N. Noble St., Chicago 22, Ill. According to the company, consistent moisture-density relationships, which will closely duplicate field compaction curves, can be developed with this Harvard miniature compaction apparatus. It will enable determination of the degree of possible compaction of earth fills for roads, dams, embankments, backfills, etc.

Feature of the new unit is its small size, which enables complete tests to be performed in less time, with less material, and less effort. The unit consists of a tamper, mold, collar remover, and sample ejector.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 483.

Sutton Joins Panero

Frank Sutton has joined the staff of Guy B. Panero, Engineers, of New York and Washington. Mr. Sutton operated his own consulting-engineering firm in New York for many years and has been responsible for the mechanical engineering design of many well known institutional and commercial buildings throughout the United States. Two of his most recent projects are the Agricultural Engineering and Animal Husbandry Buildings at Cornell.

Recoil or kick has been eliminated in the new Appton air hammer for drilling, chipping, trimming, riveting, etc.

Lightweight Hammer

A new air tool for drilling, chipping, trimming, riveting, sealing, scaling, and all-around general applications has been announced by the Burgess Thomas Co., P. O. Box 287, Bloomfield, N. J., distributor for Appton Super Hammers.

The hammer is small in size, measuring 9½ inches overall, and has a 1-inch-diameter piston. Its no-trigger construction combined with its light weight (about 5 pounds) makes for safe, easy handling, the company says. Also, the recoil or kick is said to have been eliminated. The hammer operates when pressed into contact with the work; stops when withdrawn. The tool also features force-of-blow control, adjustable from a light tap for delicate work to full power for heavy applications. This tool operates on pressures from 30 to 100 pounds in accordance with the requirements of the work.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 499.

New Plants for Air Reduction

By the end of this year, a new plant in Butler, Pa., will be turning out oxygen and nitrogen for the Air Reduction Sales Co., a Division of Air Reduction Co., Inc. The 23-acre site has already been purchased, and Koppers Co. of Pittsburgh will construct the building.

In addition Air Reduction is building a 272,000-square-foot plant at Union, N. J., to be used by its Airco Equipment Mfg. Division for the manufacture of welding and cutting torches, tips, regulators, oxyacetylene cutting machines, etc. The plant is of brick and steel construction and is near the Lehigh Valley Railroad, U. S. 22, and N. J. State Highway 29.

Fountain-Type Pen For Drafting Work

A drawing-ink fountain pen with interchangeable nibs, designed for lettering and drawing work, has been announced by John Henschel & Co., Inc., 105 E. 29th St., New York 16, N. Y. The Pelican Graphos may be used for freehand drawing, sketching, and technical drawings. The drawing ink is said to flow uniformly and without interruption, and to produce well covered, sharp-edged characters and lines. The pivot construction of the interchangeable nibs permits easy and thorough cleaning. Many nib widths are available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 435.

Lightweight Aggregate

A new 16-page catalog on Waylite, a lightweight aggregate for masonry building units, has been announced by The Waylite Co., 105 W. Madison St., Chicago, Ill. This cellular aggregate is available from five plants in the northeast quarter of the U. S. Its physical characteristics are given in detail in the booklet. Illustrations show interior and exterior finishes that can be obtained with Waylite. Construction details for all types of buildings—including commercial, industrial, and residential—are provided.

This bulletin, 4g/Wa, may be obtained from the company, or by using the Request Card at page 16. Circle No. 501.

New Offices for CSPA

The Clay Sewer Pipe Association has moved its offices to 311 High Long Building, 5 E. Long St., Columbus, Ohio.

Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Insurance of Equipment

There is an increasing tendency to combine into one policy, covering chattels, insurance against several risks, including fire, theft, windstorms, etc., instead of carrying separate policies. Before accepting a combined policy covering equipment, materials, or other chattels, the contractor should assure himself that he is as completely covered as if there were separate policies.

The foregoing suggestion is inspired by a decision rendered by the United States Court of Appeals, Eighth Circuit, November 24, 1950. The case covered insurance on a mercantile stock, but the legal angles involved apply equally to any coverage where fire insurance of personal property is included.

The decision, rendered under Minnesota's insurance laws, is to this effect: The provisions of a standard fire-insurance law, specifying what conditions may be included in a fire policy—thereby invalidating other conditions—applies not only to a straight fire policy but also to a combination policy, *unless the legislature has declared otherwise.* So, provision in a combined policy to the effect that the insurance should be void if insured failed to keep a certain percentage of valuable stock in a safe or vault would invalidate the policy as to a burglary loss. But it would not invalidate it as to a fire loss, where there was no statutory restriction as to what a burglary policy might provide, but where the requirement for deposit in a safe or vault was not permissible in a fire policy.

In unsuccessfully defending a suit on a combined policy, to collect on account of a fire loss, the insurance company's lawyers, in effect, argued that where a policy covers other risks as well as fire it is not a fire policy for the purpose of applying the provisions of a standard fire-policy law.

The insurance company lawyers also argued that because the legislature said that insurance companies could combine insurance risks in one policy, it thereby implied that such policies were not to be governed by the standard fire-policy law. But the courts replied that the Minnesota Legislature had manifested its intent by passing a law that specially exempted from the fire-policy law combined insurance on motor vehicles. That necessarily meant that that was the only class of combined policy that was exempt from the requirements of the fire-policy law.

There may be other states where similar statutes would lead to similar conclusions of the courts, but in still other states statutory differences might call for a different conclusion. Many readers may find it desirable to check upon the question whether, under local law and the language of combination policies they carry, they are as well protected against the fire risk as if they carried separate fire policies.

State Sues and Is Sued

THE PROBLEM: *Ordinarily a state cannot be sued without its consent. But the State of Connecticut sued a highway contractor and his surety for damages for alleged breach of contract in failing to complete a job. The contractor counterclaimed the reasonable value of work done on the ground that a State's man misrepresented the yardage of rock to be removed and that the contract was properly cancelled. Could he so counterclaim?*

THE ANSWER: Yes. (State v. Hartford Accident & Indemnity Co., 70 Atl. 2d 109, decided by the Connecticut Supreme Court of Errors.)

The court cited a declaration in one of its previous decisions that "if the State itself invokes the jurisdiction of the court to secure . . . relief, it subjects itself to any proper cross demand involved in the subject matter" of the suit.

Mistakes in Bidding

THE PROBLEM: *A contractor bid $116,952.35 on a county job. The next low bid was $145,550. The day after the opening, the contract was awarded to the contractor. The same day the company discovered that an office employe had failed to include a $38,062.50 item. Within two days it orally notified the county authorities, and within eight days its attorneys made written request for withdrawal of the bid and return of $5,900 deposited to secure entry into a contract. Fifteen days after the bids were opened, the county board rescinded the award and let the contract to the next lower bidder, because of the first contractor's failure to enter into a contract. Did the county wrongfully refuse to return the deposit, less $60 covering the expense of a special meeting of the board?*

THE ANSWER: Yes. (Frank W. O'Connell, Inc., v. Broome County, 98 N. Y. Supp. 2d 1009, decided by the New York Supreme Court, Broome County.)

The court was convinced that there was an honest mistake, "without any intent to defraud or overreach the

(Continued on next page)

Avoid Legal Pitfalls

(*Continued from preceding page*)

county". The decision further rested on the facts that the county was promptly notified of the mistake and awarded the contract to the second bidder without readvertising for bids. So the county was in no worse position than it would have been had there been no mistake in plaintiff's intended bid.

The court differentiated the case from one where the lowest bidder on a municipal contract immediately discovered errors in his bid, but did not inform the city of the mistakes until 32 days later. In the meantime, the contract had been awarded to him. Because of this delay in "speaking up", his suit to secure return of a $5,000 deposit was dismissed. (Brendese v. City of Schenectady, 194 Misc. 150, 85 N. Y. S. 2d 856, affirmed 273 App. Div. 813, 75 N. Y. S. 2d, affirmed 297 N. Y. 965, 80 N. E. 2d 355.)

Construction Equipment As Highway Obstruction

THE PROBLEM: *In violation of a traffic statute, a motorist was traveling a road under construction at a greater speed than permitted stopping within the distance between his car and a discernible object in the road. He struck the butt end of the lowered boom of an excavator. The accident occurred on a foggy night and the boom had been lowered across the other side of the road as a barricade to prevent travelers driving into a ditch. Assuming that the contractor was negligent in failing to maintain warning against driving into the excavator, was the motorist nevertheless prevented from collecting damages because of his own careless driving?*

THE ANSWER: Yes. (Schroff v. Foley Construction Co., 94 N. E. 2d 641, decided by the Ohio Court of Appeals, Hamilton County.)

The court recognized, as other courts have, that circumstances may excuse a driver from not having his car under control—for example, when an object suddenly moves into the space ahead. But here the motorist, knowing that he was in a dangerous area and that his lights were of little value in the fog, "drove his automobile into a static object fully discernible, except for fog, darkness, and distance."

Breach in One Contract Is No Excuse for Another

THE PROBLEM: *If a contractor is delinquent under one contract to buy material, does that excuse the seller from failure to deliver promptly under a separate contract between the same parties?*

THE ANSWER: No. (Robberson Steel Co. v. Harrell, 177 Fed. 2d 12, decided by the United States Court of Appeals, Tenth Circuit.)

Effect of Checks "in Full"

THE PROBLEM: *A contractor's auditing department cashed a check mailed to the contractor and bearing the notation "Final payment". But the contractor's contract representative, on returning to the office, immediately notified the sender of the check that the check would not be accepted as final payment and had been credited on account. Could the contractor later sue to collect a balance actually due?*

THE ANSWER: Yes. (Eckert-Fair Construction Co. v. Capitol Steel & Iron Co., 178 Fed. 2d 338, decided by the United States Court of Appeals, Fifth Circuit.)

The decision proceeds upon the theory that acceptance of a check "in full" amounts to an agreement by the payee to accept it as final payment. So it is necessary that its acceptance, as being in full, be signified by the contractor himself, or some one authorized by him to make such an agreement.

State Road Contractor's Liability to His Surety

THE PROBLEM: *(1.) Where a state highway contractor failed to complete a job, was his surety on a performance bond entitled to reimbursement by the contractor for a sum paid the state in compromise of its claim? (2.) Was the surety entitled to interest on advances made to the contractor to enable him to perform?*

THE ANSWERS: Yes. (Glen Falls Indemnity Co. v. Perscallo, 216 Pac. 2d 567, decided by the California District Court of Appeal.)

As to the second point, the court applied the general rule of law that one entitled to payment of a sum of money the amount of which is certain or can be computed is entitled to interest on that sum from the date when the debtor defaults in payment.

A Retaining-Wall Job— Liability to an Abutter

THE PROBLEM: *An owner of a building sued a contractor for damage to it, attributed to negligent construction of a flood-control retaining wall. Was the suit properly dismissed on the grounds that there was no negligence, that the contractor was not liable for subsidence of soil on plaintiff's land caused by weight of the building, and that the contractor's contract with the Government did not make him liable?*

THE ANSWER: Yes. (Whitmore v. Fago, 93 N. Y. Supp. 2d 672, decided by the New York Supreme Court for Steuben County.)

Citing previous decisions of higher courts, the court reached these, among other, conclusions:

(*Concluded on next page*)

A contractor is not liable for damage to adjacent property caused by mere concussion in blasting not negligently done.

Defendant was not bound to stabilize plaintiff's building before excavating for the wall and driving and pulling piling.

Defendant's contract with the Government to be liable for damage to property due to negligent prosecution of the work did not require him to shore the building.

Defendant was not liable to plaintiff for failing to take his own test borings, which would have disclosed soil conditions endangering the building; he having relied upon government borings indicating better soil in which to build.

Contractor's Relation To Haulage Contractor

THE PROBLEM: *Was a road contractor liable for injuries caused by negligent driving of a truck used in hauling material? The truck was owned and operated by one engaged on his own account in hauling materials for anyone desiring his services; the trucker paid all operating expenses, and was free from control by the road contractor, except as to where to load and unload materials.*

THE ANSWER: No. (Johnson v. Angretti, 73 Atl. 2d 666, decided by the Pennsylvania Supreme Court.)

The court applied the distinction between the status of an "independent contractor", such as the trucker was declared to be in this case, and an "employee". The court noted what has been stated over and over by courts throughout the land: that the chief distinguishing feature lies in the fact that the independent contractor is responsible only for results, being free to accomplish them without control by the party served, while an employee is subject to control as to how he shall do his work.

Foreign Project Boss Not Liable to U. S. Income Tax

THE PROBLEM: *A Kentuckian was sent to Costa Rica as manager for a contractor having a contract to build a section of an international highway there. He and his wife complied with Costa Rican regulations for establishment of a residence there for the duration of the job, and remained there throughout the years 1942 and 1943, complying with income-tax regulations of the country, although not being required to pay any taxes. Over his protest, Uncle Sam taxed him for those two years as a resident of Kentucky. Was the manager entitled to compel a refund?*

THE ANSWER: Yes. (Wood v. Glenn, 92 Fed. Supp. 1, decided by the United States District Court, Western District of Kentucky.)

The court decided that intention of the taxpayer and his wife to resume their residence in Kentucky after his employment in Costa Rica ended, which they did, could not alter the fact that for the two years in question they were not residents of this country.

Federal Fair Labor Act Was Held Not Applicable

THE PROBLEM: *Were employees of a Federal ordnance-plant contractor covered by the wage and hour provisions of the Federal Fair Labor Standards Act?*

THE ANSWER: No. (Cooper v. Rust Engineering Co., 181 Fed. 2d 107, decided by the United States Court of Appeals, Sixth Circuit, affirming a decision of the United States District Court, District of Kentucky, 84 Fed. Supp. 149.)

The court said that the work of defendant's employees "was limited to local intra-state building activities".

Late Demand for a Bond Held a Contract Breach

THE PROBLEM: *After a building contract had been made and partly performed, the owner refused to make a progress payment unless the contractor would give a performance bond not required by the contract. The contractor refused to give the bond and the owner locked the toolhouse on the job and posted a "No trespassing" sign. Did the owner thereby break the contract and throw himself open to a suit by the contractor for damages for profits lost by the owner's breach?*

THE ANSWER: Yes. (Guidry & Swayne v. Miller, 47 So. 2d 721, decided by the Louisiana Supreme Court.)

Statute on Bidding Applied

THE PROBLEM: *A Utah statute required that bidding on public work be readvertised if bids received should neer's estimate was $257,000, and the exceed the estimated cost. A city engidefendant's bid was $266,347.60. But before the bids were opened, the city received a belated estimate from the civil engineers who prepared the plans and spex. That estimate exceeded all bids presented. Did the city have a right to award the contract to defendant?*

THE ANSWER: Yes. (Johnson v. Utah-Idaho Concrete Pipe Co., 223 Pac. 2d 418, decided by the Utah Supreme Court.)

The court said that the statute plainly intended that the municipal authorities have before then an estimate to guide them in determining the reasonableness of bids, but did not require that the estimate be on file earlier than the time of opening the bids. Although the higher estimate was received late, the city commission studied it thoroughly before awarding the contract.

The Tru-Line spring clip is applied to plain-end Bosco perforated pipe with a simple hand tool designed by Bowerston especially for the operation.

A New Spring Clip For Drainage Pipe

The new Tru-Line spring clip developed by The Bowerston Shale Co., Bowerston, Ohio, is designed to simplify jointing operations, reduce installation costs of perforated drainage lines, and make lines more stable under backfilling. It is applied with a simple hand tool. The spring clip lies flat against the pipe and permits jointing of two or three lengths on the trench bank. It is made of No. 9 oil-tempered or hard-drawn spring wire coated for rust resistance.

Full details on this new method of jointing and aligning plain-end perforated pipe may be obtained by requesting Bulletin Bosco 849 from the company. Or use the Request Card at page 16. Circle No. 416.

Lengthens Tire Life

A new protective material which is brushed on the inside of a tire and coated on the rim has been developed by American Sand-Banum Co., Inc., 9 Rockefeller Plaza, New York 20, N. Y., to lengthen tire life. This product, it is claimed, will keep tires cool, eliminate creep between tire and tube, and prevent rusting and "freezing" of rims, bolts, and nuts. Pro-Tex-Tire is nontoxic, noninflammable, and harmless to personnel and equipment, the company says. The material is applied by brushing the entire inside of the tire, then inserting the tube and coating the rims before mounting the tire.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 481.

Concrete Storage Bins

A 12-page folder describes storage bins manufactured and erected by The Neff & Fry Co., 174 Elm St., Camden, Ohio. Distinctive feature of the bins is the diagonal-ended concrete stave which is formed under 140-ton hydraulic pressure to give it rocklike density and strength. Hoops of galvanized-steel rods drawn around the walls achieve prestressed reinforcement, the spacing of hoops being calculated against predetermined interior lateral pressure. The bins are waterproofed when desired, by buttering the edges of the staves with a mastic substance and by coating the walls with waterproofing agent.

The folder indicates the bulk materials which may be handled in the bins. It also points out that these structures may be employed as cooling towers, dryer housings, dust bins, mixing tanks, etc. Data tables show the capacities of the bins in bushels, cubic feet, and tons, in relation to heights and diameters. There are photographs of typical installations.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 420.

Puerto Rican Power, Irrigation Project

Puerto Rico has completed the first year of construction on the largest combined irrigation and power project in its history—the Southwestern Puerto Rico Project. By diverting water which falls on the north side of the island's mountain divide to the south side by a system of reservoirs, tunnels, and canals, it will provide hydroelectric plants with an estimated annual generation of 100,000,000 kwh; irrigation facilities for more than 26,000 acres of rich but arid lands in the southwestern portion of the island; and a daily supply of 6,500,000 gallons of potable water to various municipalities in the region.

The plans include a scheme for reducing the salinity of some areas, which will be irrigated later to bring the total of arable lands to be improved to 39,000 acres. Much of this land will be capable of producing from 40 to 60 tons of sugar cane per acre. The entire project will cost about $25,000,000. It is being built under the direction of Antonio Lucchetti, Executive Director of the Puerto Rico Water Resources Authority, San Juan, P. R.

Five dams, ranging in height from 60 to 200 feet, will be constructed; 62,000 feet of tunnels from 7 to 8½ feet in diameter will be driven; 1,300 feet of pressure pipelines will be laid; two hydroelectric plants will be built; and an irrigation system with 25 miles of main canal and pipelines, plus lesser canals and pipelines for distribution, three pumping stations, and a drainage system will be constructed.

The principal dams on the north side of the main divide will impound the waters of upstream tributaries of the Anasco River, which flows north into the Atlantic Ocean. They are the Yahuecas, Guayo, and Prieto Rivers. They have a combined drainage area of 36.6 square miles. The Prieto reservoir is at a higher altitude than the tunnel which will collect the waters and convey them to the 26,000-foot tunnel across the mountain range. A shaft leads down from the reservoir to the tunnel, which will pass underneath.

Another combined-purpose project has been planned although not begun—the Coamo-Bauta Project. It will be built according to the same general principles employed in the construction of the Southwestern project and will irrigate some 4,700 acres of land in the Coamo Valley. The head developed on the southern slopes will be utilized to produce about 15,000,000 kwh of electric energy annually.

Need information on equipment? Use Request Card at page 16.

No peace for bricklayers—not even in winter. Cold weather no longer halts construction as the winter scene above demonstrates. Canvas-covered heated scaffolds keep workers warm despite low temperatures.

Owatonna's four new lightweight wrenches come in 6, 8, 10, and 12-inch lengths, providing maximum capacities of ¾ to 1 5/16 inches.

Adjustable Wrenches

Four new thin, lightweight, balanced, adjustable wrenches have been announced by Owatonna Tool Co., 381 N. Cedar St., Owatonna, Minn. They are made of alloy steel and are precision-built to exacting standards, the company says. The jaws are tapered for ready access into close places, yet wide and deep enough to obtain a full bite on either hex or square nuts. The wrenches are heat-treated with chome-plate finish, and are made in 6, 8, 10, and 12-inch lengths, providing maximum capacities of ¾ to 1 5/16 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 490.

Reflectorizing for Safety

An 8-page booklet called "The Story of Centerlite" has been offered by Minnesota Mining & Mfg. Co., St. Paul 6, Minn. Centerlite is a reflective pavement-marking material consisting of millions of microscopic glass spheres premixed in a white or yellow compound. Applied with regular spray equipment, it bonds to the road in a uniform coating that increases in brilliance with wear. Why this is so and just how much brighter reflectorized coatings are than ordinary white paint is discussed in the booklet. Illustrations show the safety value of this material and the improvement in reflective values with increase in wear. The booklet also contains data on the initial, application, and maintenance cost of Centerlite.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 531.

Cab and Cargo Heaters

Brief descriptions and specifications of the complete line of Hunter gasoline-burning cab and cargo heaters and dry-ice cargo refrigeration systems are given in a compact 4-page folder issued by Hunter Mfg. Co., 1550 E. 17th St., Cleveland 14, Ohio. Illustrated with photographs and drawings of various models, it also contains drawings of recommended installations.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 487.

Eutectic Builds

Eutectic Welding Alloys Corp., of New York City is constructing an engineering services building at the site of the company's Flushing plant. The 20,000 square feet of space in the new structure will be used for housing administrative, engineering, and technical personnel, and for laboratory facilities. One of the building's up-to-date features is its air-raid shelter.

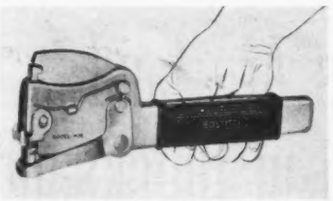
New Concrete Buckets

Two new concrete-handling buckets have been engineered by Henke Mfg. Co., Janesville, Iowa. They are the Models 12 and 16, with capacities of 12.75 and 16.75 cubic feet, respectively. These buckets feature angle reinforced bottoms, protected nose, 8 x 8-inch discharge, and a swinging gate that is open for loading and closes when the bucket is raised.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 504.

New Stapling Hammer

The new Model H2B stapling hammer announced by Bostitch, 1065 Mechanic St., Westerly, R. I., manufacturer of stapling machines and staples, has been designed especially for high-speed tacking and light nailing jobs. Builders can apply roofing paper, insulation pads, and even metallic insulation at top speed and with less worker fatigue,



The new and improved Bostitch H2B stapling hammer.

the company claims. The H2B can be used for tacking concrete-form lining and many other jobs.

Among the improvements in design and construction are plating for rust resistance, a new-style driving lever for better balance, and a new-type pusher to eliminate jams. It takes one hand and one blow to drive the staple all the way home, Bostitch says. The H2B uses staples of 0.050 x 0.019 wire, available in several leg lengths.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 405.

Grouting Operations

A new 4-page bulletin outlining the features and applications of the Prehy grouter has been prepared by The Prehy Co., 420 Lexington Ave., New York 16, N. Y. Front and side illustrations show the component parts and basic operation of the Prehy Type S grouter. The tank has a charge capacity of 3.5 cubic feet and will operate under normal working pressures of 30 to 100 psi. The 1¼-inch-diameter discharge is used for normal grouting operation and intrusion work; a 2-inch-diameter discharge may be used for coarse-aggregate compositions.

The literature points out that auxiliary equipment such as grout hose, jam plugs, driving points, etc., are available. The bulletin outlines various applications for Prehy injection work: soil stabilization, reconditioning of structures, waterproofing, etc.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 512.

Sanitary Sewers Are Laid In Rock and in Quicksand

Clay, Concrete, and Cast-Iron Pipe Will Replace Cesspools In City Improvement; Digging Conditions Pose Problems

(*Photo on page 1*)

• CESSPOOLS in East Providence, Rhode Island, will be a thing of the past with the completion of a $625,000 contract for the construction of a new sanitary sewer system. C. L. Guild Construction Co., Inc., of East Providence, has the contract which got under way in July, 1950, and is scheduled for completion in August, 1951. Over 77,000 linear feet of pipe—vitrified clay, reinforced concrete, and cast iron—is being installed, ranging in size from 6 to 21-inch diameter. Included in the sewer system are 250 new manholes.

East Providence has a population of 32,165, rather densely settled over an area less than 3 square miles. Only a small central section of the city had the benefit of sewers. The new system will serve the entire city. Sewage from the north end of town will be treated at the Blackstone Valley plant of neighboring Pawtucket on Buckland Island. The remaining sewage will be treated at a new plant to be built under another contract in the Riverside section of East Providence.

The wide variety of soils encountered over a relatively small area made trenching anything but a routine job. The subsurface ranged all the way from rock to quicksand, including hardpan, clay, sand, and ledge. In such conditions, cesspools failed to render satisfactory service. Traffic is heavy in East Providence, and the length of trench opened up at a time was held to 300 feet. Pipe was laid and backfilled in these short sections in order to close off as little of the streets as possible.

Backhoes on Excavation

Excavation in the contract totaled 83,000 cubic yards, of which 80,000 yards was earth and 3,000 yards rock; the latter included some boulders, but most of the rock was granite. The average depth of trench over the entire area was around 12 feet, with the maximum going down to 26 feet in dirt and 18 feet in rock.

Blast holes in the rock were drilled with six Gardner-Denver jackhammers using 1-inch round drill steel in lengths of 2, 4, 8, and up to 20 feet, and Timken carbide bits. Air was supplied by two 315-cfm compressors—a Gardner-Denver and an Ingersoll-Rand—each compressor serving three jackhammers. The holes were charged with 60 per cent strength dynamite, but because of nearby houses the greatest charge included only eight holes. The danger of flying rock was eliminated by covering the section to be blasted with heavy woven-wire mats.

C. & E. M. Photo

A Lima 604 1½-yard backhoe excavates a trench on the Guild sewer-system contract. It loads some of the material, not required for fill, into a truck.

The bulk of the trench excavation was handled by backhoes including two Limas—a ¾-yard 34 Paymaster and a 1½-yard 604 model—and a ¾-yard 25 Northwest. The contractor also employed two truck cranes—an HC-90 Link-Belt Speeder with a 1-yard backhoe attachment which was changed when required to a 60-foot boom equipped with a P-M 1-yard clamshell bucket, and a Lorain 40 Moto-Crane having a 40-foot boom and a ¾-yard clamshell bucket. The truck cranes looked after the manhole excavation.

Sheeting in Narrow Quarters

In soft ground, or where lack of space prevented the laying back of flat side slopes, the sides of the trenches were lined with 2-inch wooden sheeting braced with 6 x 6 rangers and cross struts. The sheeting was driven with a Gardner-Denver air hammer powered by a Le Roi 105-cfm compressor.

The high water table over most of the job required constant pumping to keep the short stretches of trench unwatered. An assortment of pumps in use included a 6-inch Jaeger, two 4-inch C. H. & E.'s, a 4-inch and 3-inch Gorman-Rupp, a 3-inch and 2-inch Jaeger, and a 2-inch Gorman-Rupp. During the 1950 operations the pumps handled the water satisfactorily, and wellpoints were not required. Water from the trenches was pumped into

(*Concluded on next page*)

nearby storm sewers.

Sewer installation began at the lowest portions of the project and proceeded in the direction of higher ground. Work was carried on in at least three different locations at the same time. Where the excavation indicated a surplus of backfill, the excess material was loaded into a fleet of six Dodge 4-yard trucks which were held available and hauled away to a dump.

Special Boxes Used

In some of the deeper cuts where a free-flowing wet soil was encountered, great difficulty was experienced in keeping the trench open for laying the pipe, even when the side slopes were kept to the natural line of repose. This problem was overcome when the contractor constructed a pair of sturdy steel boxes 10 feet long, 4 feet deep, and 3½ feet wide with open bottoms. At one end the boxes were closed, while the open side at the opposite end was braced across the top with angle irons.

The two boxes interlocked at their open ends and were laid at the bottom of the trench. Then they were forced down to grade by the pressure of a clamshell bucket from a crane at the top of the trench. The wet dirt forced up into the boxes was mucked out with the clamshell that just fitted inside the steel sides. Thus a clean, dry area was provided in which to lay the pipe. In all sections of soft ground not providing a suitable foundation, the pipe was laid on a bed of screened gravel 12 to 24 inches thick.

Three Kinds of Pipe

Because of its greater lengths of 18-foot sections, cast-iron pipe was employed where the ground was soft and unstable. The U. S. Pipe & Foundry Co., of Phillipsburg, N. J., furnished 3,960 linear feet of 6, 8, and 20-inch C.I. pipe. Reinforced-concrete pipe in 18 and 21-inch diameters totaled 7,709 linear feet, and was supplied by the Rhode Island Concrete Pipe Co., of Providence. The largest pipe item was the vitrified clay that totaled 65,430 linear feet in sizes from 6 to 15-inch, with most of the pipe being in the large 12 to 15-inch size since this initial contract was chiefly on trunk lines. Laterals of 6-inch V.C. pipe extended only to the property lines; house connections will be made under a future contract. The Evans Pipe Co., of Uhrichsville, Ohio, furnished the clay pipe.

The smaller-sized pipe was set by hand, while the larger sections were lowered into the trenches by the backhoes or cranes. The bell-and-spigot reinforced-concrete pipe in 4-foot lengths, and the vitrified clay in 3-foot lengths, were sealed at the joints with GK compound. Leadite was used in the joints for the cast-iron pipe.

For backfilling and general cleanup work, the contractor had a Caterpillar-mounted 1-yard IT-4 Traxcavator, an Allis-Chalmers HD-5 tractor-dozer with a 1-yard front-end loader, and an International TD-9 dozer. Rock was not used in backfilling operations, and the dirt employed was thoroughly jetted to insure good compaction. Jetting was done with a 1½-inch steel pipe at the end of a fire hose connected to a hydrant. As the fill was placed, the jet pipe equipped with a quick-closing valve at the elbow joint was stuck in the ground at 2 to 3-foot intervals. In roadway areas gravel was laid for the top 18 inches as a base for the paving.

C. & E. M. Photo

A Jaeger 5½-yard mixer on an Autocar supplies manhole concrete on the Guild job. The steel manhole forms were built to the contractor's spec.

Manholes

Manhole construction costs were kept down by the design features of 12-inch poured-concrete walls for all but the upper 2 feet of height. This top portion is built of brick to permit easy adjustments in the final grade for future street paving. The bricks are plastered over for waterproof protection. Steel manhole forms in sections 2 feet high were built by the Massachusetts Engineering Co., of Quincy, Mass., and erected by the contractor. The sections were handled from a truck equipped with an A-frame and 22-foot pole hoist at the rear, and were bolted together to make a single integral form. The manholes averaged 12 feet in height.

Transit-mix concrete for the manhole pours was furnished by the M. A. Gammino Construction Co., of Providence, using Jaeger 5½-yard truck mixers mounted on Autocars.

Personnel

The new sanitary sewer system for the city of East Providence, Rhode Island, was designed by Charles A. Maguire & Associates, Consulting Engineers, with offices in Providence and Boston, Mass., for whom F. T. Mulcahy is Resident Engineer.

A force of 60 men is employed by C. L. Guild Construction Co., Inc. Lee Palozzi is Superintendent.

The 5,000-pound hydraulic Wissota jack operates in any position.

All-Position Jack

A 5,000 pound all-purpose hydraulic tool and jack has been brought out by the Wissota Mfg. Co., 1301 S. 3rd St., Minneapolis 4, Minn. It will operate in all positions—vertical, horizontal, or upside down—the company says. The 21-inch handle swivels in an arc. Suggested applications for this unit are lifting tractors, trucks, and other machinery; pulling and spacing tractor wheels; pulling gears, pulleys, sprockets, etc.; bending, spreading, pushing, and pulling. With the 7-foot ¼-inch high-test chain, lifts can be made from below the base level of the jack.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 430.

Universal Sockets

Five Proto universal power sockets and a universal joint, employing a ball-type coupling said to be a big improvement, have been announced by the Plomb Tool Co., 2209 Santa Fe Ave., Los Angeles, Calif. They are designed for pneumatic or electric-power impact wrenches with ½-inch square drive, but are also serviceable on adapter-equipped ⅝ and ¾-inch drive wrenches. The sockets have ½, 9/16, ⅝, 11/16, and ¾-inch hexagon (6-point) openings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 533.

Manages Truck Sales

Donald T. Ellis, identified with Willys-Overland sales activities for the past five years, has been named Fleet and Truck Sales Manager.

Automatic Torque Control Used on Engines or Motors

Literature prepared by the Mercury Clutch Division of Automatic Steel Products, Inc., Canton 6, Ohio, explains how Mercury clutches can be used to provide automatic torque control for both gasoline engines and electric motors. All features of the clutch are fully outlined, and in many cases illustrated with small sketches.

Sizes are available for all popular makes of gasoline engines ranging from ¾ to 24 hp. The electric-motor clutches are selected to obtain high efficiency as well as to afford complete protection from the hazards of overload and low-voltage conditions. They are available for motors ranging from ⅛ to 15 hp at 1,800 rpm. The catalogs point out that, though the selection of standard styles will meet most requirements, special styles to suit individual specifications are also available.

This literature may be obtained from the company by requesting Bulletins 216, 217, and 218, or by using the Request Card at page 16. Circle No. 412.

AC and DC Generating Units

A complete line of gasoline-engine-driven generating units, in sizes from 500 to 25,000 watts, is described in a catalog prepared by General Lighting Products Division, BFM Industries, Inc., 2124 Mill Ave., Brooklyn 34, N. Y. The dc and battery-charging plants come in models providing 6, 12, 24, 32, 115, and 220 volts. They have a heavy-duty reverse-current cutout; this automatically connects the generator to the batteries when the plant is started, and disconnects the batteries from the generator when the plant is stopped—thereby preventing discharge of the batteries back through the generator. The air-cooled single-phase ac generators provide a 115-volt current. Standard equipment on them includes stop buttons, reverse-current cutout, cranking relay, battery-charging ammeter, and air cleaner.

Unit sizes and specifications are given in the catalog for both ac and dc generators. There are additional data on custom-built plants for special application, and on accessory equipment for the General lighting plants. The latter includes remote control, full automatic control, transfer switch, electric fuel pump, natural and LP gas carburetor, special muffler, and starting battery.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 428.

Article on Hard-Surfacing

"Hard-Surfacing Manganese Steel" is the title of a new 4-page bulletin released by Rankin Mfg. Co., 3072 W. Pico Blvd., Los Angeles 6, Calif., manufacturer of Ranite hard-surfacing welding materials. The article outlines applications, precautions, and suggestions on the proper procedures. It states that success in facing manganese depends on keeping temperatures down throughout the body of the steel, a precaution which should be observed on pieces even as small as a shovel tooth. It says that where such precautions have been observed, manganese has been successfully hard-surfaced, saving users of manganese steel many thousands of dollars.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 534.

Western Office for Pennsalt

The Pennsylvania Salt Mfg. Co., Philadelphia, Pa., has opened a new sales office in the Woolsey Bldg., 2168 Shattuck Ave., Berkeley, Calif.

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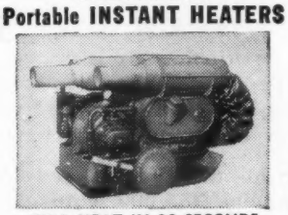

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Excavation for the Lost River diversion Canal south of Klamath Falls, Oregon, involved 1,100,000 cubic yards of alkaline silt and hardpan. George R. Stacy of Tulelake, California, had the contract... and two self-loading, rubber-tired D Roadster Tournapulls to handle most of the short-haul dirt. Here's the kind of Tournapull performance which helped finish the job well ahead of the schedule specified by the United States Bureau of Reclamation:

Working in light, easy-loading silt without a pusher, each Roadster loaded 5 pay yards in 1 minute. Total time for a typical 1200' cycle—including load, haul, spread, and return—averaged 3 minutes. On the basis of 50-minute efficiency, that's 17 trips and approximately 85 pay yards per hour per unit.

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"Tournapull's ability to self-load this material and its ability to go through soft ground certainly surprised me," says Contractor George Stacy.

Self-loading light alkaline silt, 122 h.p. D Roadster picks up 5 pay yards in approximately 1 minute.

Operator likes its electrical controls

"Electrical controls make the D Roadster easy to operate and simple to service," adds operator Dave Logan. "This electrical system is a real advance for earthmoving machines."

In all, the 2 high-speed Roadsters handled approximately 385,000 yards. Their operating efficiency during this time was 95% for one unit and 100% for the other, according to contractor's records.

Drive to job at 20 m.p.h.

And here's another advantage recorded by Stacy. His D Tournapulls lost no time moving to this job, driving in over paved highways. They made the last 10-mile leg from Klamath Falls in 30 minutes.

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